COTTON

A MONTHLY TECHNICAL JOURNAL DEVOTED TO COTTON ITS UTILIZATION AND PRODUCTS.

VOL. XIV. ATLANTA, GA., MARCH, 1907. No. 4.

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COTTON

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WITH THE PUBLISHERS.

It is an easy matter to make promises, but it is in the fulfillment thereof that the test comes. The new owners of this publication have made their share of promises to both the old and new friends of COTTON. It is not within the limits of human ability to metamorphose a great publication in a night, but we are proud of the first month's achievements of the new organization.

We offer our friends the March issue of COTTON with considerable pride on account of its better and cleaner typographical arrangement, its increased pages and its splendid contributions. However, this issue marks but the first step of the new organization and is but a small earnest of what we can and will do with the magazine.

Our staff of correspondents and contributors is in no wise complete, nor can we say that the wheels of our business and editorial organization are yet moving with that precision which we desire and shall attain, in order to accomplish the great object we have in view—that is: To give, not alone the South, but the entire field, at home and abroad, the best textile publication which has ever been produced, particularly with reference to the manufacture of cotton and the mechanical operations by which this product is converted into commercial fabric.

We wish to announce that the forthcoming issue for May, in honor of the American Cotton Manufacturers' Convention at Philadelphia, will constitute a mile stone, a high water mark of achievement in the matter of a textile publication. Good things are not always offered in attractive dresses, but the May issue of COTTON will prove an exception to this rule for it will be encased in special covers, prepared by one of the foremost illustrators in this country and at an expense of several hundred dollars.

The matter contained in the May issue, the contributions, and special articles, are being prepared by the most eminent authorities we are able to induce to write—men whose authenticity and expert knowledge with respect to textiles is beyond question. In short the Convention Issue for May will constitute an epitome of textile accomplishment.

The confidence and good will shown the new organization by the trade, as evidenced by over two hundred new subscriptions and a very gratifying number of renewal and new advertisers, during February, is keenly appreciated.

In conclusion, let us call your attention particularly to the good things in this issue.

N. L. Willett, is preparing a series of articles—the first installment of which appears this month on "Leading Types of Cotton." Mr. Willett is one of the best informed living men on this subject, and his discussions will surely interest every may who is a purchaser or user of the South's great staple.

Our Dyeing Department treats a line of subjects for men interested in this particular work. The author is a graduate chemist who has made the dyeing of cotton fabrics a life work.

Not only engineers of cotton mills, but owners, will be interested in the description of the "Power Plant of the Fulton Bag and Cotton Mills," by H. H. Kelly. This mill is one of a series under the same management where great economy of operation is exercised without losing sight of the necessity for the most modern labor-saving, time-saving and dollar-saving equipment.

In "Design of Textile Fabrics," G. Alfred Harbour contributes a carefully prepared article, the title to which suggests fully its subject matter.

A host of other articles of both technical and popular interest occupies the remainder of our reading columns and it is our hope to offer in each succeedng issue such matter as will interest the very greatest body of our subscribers.

THE VALUE OF UP-TO-DATE MACHINERY.

The well-recognized supremacy of the American shoe manufacturer over that of his British cousin, points a moral, too obvious to be neglected by the American manufacturer of textiles. The argument is often advanced, that, on account of the cheaper labor in the English factories, the English manufacturer can purchase American grown cotton, pay the transportation charges to his mills, produce the finished product and return it to the United States, underselling the American manufacturer in his own market.

There is no denying that a great many of our textile mills are conducted under such conditions as to give truth to this statement. Particularly is this the case in the South, and the invariable answer of the manufacturer is, that he cannot meet English labor conditions; that he cannot, with his unsatisfactory labor, compete successfully in the manufacture of the finer grades of textiles. Looking again to the American and English manufacturer of shoes as a parallel; it is a fact that hides from the Argentine Republic are laid down in England at a price that compares at least favorably, if not below that which the New England shoe manufacturer pays for those from Texas and the West; but because of better mechanical appliances the American manufacturer makes equally as good or a better product at less cost.

Is it not true that a majority of the textile mills are being conducted on methods which are, in many instances, largely antiquated? Are they not expecting and requiring the man to do what the machine should do? Particularly in some Southern mills there is a reluctance about transporting to the junk heap a great deal of textile machinery which should be replaced by more modern machinery.

There are a large number of Southern Mills where the resulting increase in the product, would, in two or three years' operation, more than pay the cost of improved machinery. A very good illustration of this is shown in a large mill that had made two successive failures under different owners, and which was later taken over by energetic, capable management, who made an entire change in the equipment and without regard, practically, of cost, installed throughout the most modern appliances that could be secured; then the direction of this apparatus was placed under skilled and educated supervision, men who knew absolutely what they were doing and why they were doing it, men of the finest technical textile training, superintendents and overseers who had spent years in securing their knowledge. The results secured as a sequence of this policy have been so remarkable as to be almost beyond belief.

There is a tendency among many manufacturers to deride or belittle the modern technical graduate, repudiating the value of this kind of training with the statement that, "Only years of practical experience can make a good superintendent or foreman." If they would look to other fields, for instance, among the big machine-tool manufacturers, they would find that the man with both technical training and practical experience is being given precedence, although he is often a young man, and may appear full of radical and costly ideas. They will find that the great successes in these other lines are being made by those manufacturers who take advantage of every new mechanical application offered and who listen with respect to the men who have been taught to handle such appliances and are not afraid to make what sometimes seems to be costly changes and innovations that are, from a superficial viewpoint, apparently unwarranted.

Greater investigation, greater research and infinite watchfulness on the part of the textile manufacturer concerning new and improved machinery is necessary, to the end that the machine, instead of the man, especially as represented by the unskilled labor of the South, shall be depended upon to render that margin which spells success and profit.

THE YOUNG MAN'S OPPORTUNITY.

The somewhat hackneyed advice of Horace Greeley to the young man, to "go West," is being parodied these days by counter-advice to the young man to "go South." Such advice is well given, as those who have investigated industrial conditions in the South know. The West may still offer brilliant opportunities to the young man, but surely none greater than those offered by the South.

In one respect, particularly, the South offers a decided inducement to the young man of technical training which he can not secure in the West, and that is along the line of textile engineering. Our universities are graduating regiment after regiment of mining, electrical and civil engineers each year. So great has been the flood of young engineers in these lines that, like the medical and legal professions, the demand in no measure equals the supply, and, as a result, numbers of these graduates spend their lives, some in drafting rooms, others in semi-political surveyorships, etc., for a modest remuneration.

In textile work, however, the few schools devoted to this profession are thoroughly inadequate to fill the demands made upon them, and in one instance now before us, 94 per cent. of the senior class of a textile school had secured positions before graduation. When it is realized that a graduate of a good textile school can, after a three or four years' course, secure almost immediately a position in which, if he can in any wise meet the demands made upon him, he is able to reap a reward in the shape of a position as superintendent, mill agent or manager of a large textile mill, at an average salary much greater than that afforded by, for equal talent, other lines of engineering. And when it is understood that a textile education is no harder to secure than a knowledge of mining or civil engineering, the wonder is that more young men do not devote themselves to this work.

Young man, before you decide, finally, to spend four years in the endeavor to enter any already crowded profession, why not investigate somewhat the opportunities offered in the textile field? Inquiry addressed to any one of the textile schools will secure information which will open your eyes to the possibilities of a profession in which there is an opportunity for greater achievement and reward and in which competition is not as keen as in other lines.

BRITISH COTTON HANDLING.

Special Agent, William Whittam, Jr., in a detailed report on cotton buying in Lancashire issued by the Department of Commerce and Labor under date of March 11, in addition to interesting statistics regarding the importation of cotton into

England from the United States and other countries, develops several phases of cotton buying and manufacture well worth consideration. To quote,

The advantages of the Lancashire district as a cotton manufacturing center may briefly be said to be the sum of numerous great and small economies in buying, selling, and manufacturing processes effected by fierce competition in a relatively congested area. As Liverpool unquestionably sells more cotton direct to spinners than any other city in the world, an examination of the market from a user's viewpoint is both interesting and instructive to American mill men; for whenever our mills attempt to enlarge their shipments to other countries their owners will be better prepared for the certain keen competition before them, if they are informed of the conditions under which their competitors have been able to secure and hold exterior trade for so many generations.

The advantages of the Lancashire district as a cotton manu- competitor is in having a much wider range of varieties of cotton to select from. With the exception of Egyptian grown cotton, American manufacturers are confined largely to home-grown material. The Lancashire spinner, on the other hand, can select from a number of varieties of American, Brazilian, Peruvian, West Indian, East Indian, West African and East African, which last comprises several different varieties. We quote again:

Having such a range to select from enables the buyer in Liverpool to lay down a "mixing" to meet any demand which may be made for price or special kinds of yarns.

The Lancashire spinner is fully alive to the saving to be gained by "mixing," as witness:

It is not uncommon here for different cottons which approach each other quite nearly in length of staple to be mixed together when an advantage in price can be gained by so doing, or where color, strength, or oozy characteristics are required in yarns for special uses. Considering all the differences in marked features of the cottons, as well as in their selling prices, it is obvious that the Lancashire spinner has here an advantage over his American competitor in the production of the many sorts of fabrics demanded by foreign consumers. This range of material has also developed in the English mill manager a keen discrimination between the possibilities of the several types. He is thus frequently, by judicious selection and careful mixing, enabled to effect material savings in the cost of his mixing over what it would be were he confined in his operations to one growth.

Mr. Whittam takes up the question of care in purcashing raw cotton and contrasts the apparent carelessness of American methods with the care of his British competitor in re-valuation on the basis of real spinning worth. This is what he has to say in that line:

Except where buying sea island, Peeler, and other staple cottons the merchant in the Southern States when bargaining for uplands or Gulf merely opens a handful taken from the bale and classes it by its color and cleanliness, taking into account also any evident damage done in ginning. Before similar cotton reaches the English spinner it has undergone a much more careful examination and re-valuation on the basis of its real spinning worth. Buyers here spend consiberable time over each sample they examine. Knowing the denomination or variety they need, the spinner next takes into account, when arriving at its value to him, the price asked, the effects of ginning on the physical condition of the lot (this should teach American planters the lesson that carefully ginned staple will bring better prices), such faults as cut, napped, curled, or twisted fibres being looked for. Discoloration, the qualities of leaf, broken seed, fast or unginned seed, sand, and excessive moisture are also considered. Besides these, the length of staple of the shortest sorts is examined and the comparative strength, silkiness, and elasticity of the fibres are taken into consideration, not forgetting the bearing that the quality of short, immature, imperfectly developed and unripe fibres will have on the amount of waste made in the mill, as well as the effect the presence of an abnormal proportion of such fibres will have on the strength, elasticity, and general weaving value of the resultant yarn.

It is an unquestionable fact that gross carelessness marks the handling of American cotton from the time the boll opens in the field to the time the bale is opened in the cotton mill, and the circumstantial evidence in the case indicates that to this carelessness is largely due the supremacy of the English spinner. The South produces almost as many varieties as go through the port of Liverpool, and it is probable that with a better system of grading we could offset any advantage the English spinner gains from "mixing."

Mr. Whittam develops another point in which the Lancashire spinner takes advantage of his American cousin. This is in cheapness of material used by the English spinner for some counts. The report says:

Liverpool grades of American cottons follow those of the United States in name, but are slightly better in quality. On the other hand, the Lancashire spinner generally uses cheaper cotton than does his American competitor for the same counts. This practice gives him another slight advantage in foreign trading.

This leads us to remark that the lessons of finance are learned but slowly in the South. In some parts of the South penny change is to be had only at the postoffice. In the stores the nickel is the unit of trade. While the buyer of cotton—the paid buyer—may be forced by his employers to realize the value of the penny in prices, still in grading the nickel idea still clings to him.

The board of government of the National Association of Cotton Manufacturers have held a meeting at which arrangements were made for the annual meeting which will be held in Boston on April 24-25. This will be the 82nd meeting of this organization, and promises to be of unusual interest. Two sessions for reading of papers will be held on Wednesday, April 24, and a banquet will be held in the evening. On the following day one session will be held in the forenoon, and the afternoon will be devoted to an excursion complimentary to the association. At this meeting numerous papers by members will be read, and addresses given both at the meetings and at the dinner by guests of the association.

The work of this association during the past year has been prosecuted with its usual vigor for the benefit of the interests represented by the members, notably in connection with the cotton crop statistics and certain matters pertaining to the tariff on cotton goods. Arrangements have been made by which members may consult the collection of fabrics at the Boston Museum of Fine Arts, and copy either by brush, pencil or camera, designs upon which more permanent study is desired.

The national association of cotton manufacturers was fundamentally established in 1854 as the Hampden County Cotton Spinners' Association which, outgrowing the local limitations suggested by its name, became in 1865 the New England Cotton Manufacturers' Association, and like reasons caused the change to the present name in 1906.

THE LEADING TYPES OF COTTONS GROWN IN THE SOUTH TODAY AND DESCRIPTIONS OF EACH.

N. L. WILLET, Augusta, Ga.

The South stands and must continue to stand between the world and nakedness. Far greater than the increase of the worlds population is the increase universally in the consumption of cotton. As far remote regions are better reached by improved transportation facilities, as savages and semi-savages are the more reclaimed by civilization, while continued new uses (daily demonstrated) are found for this the world's most marvelous fibre, what amount of cotton will not the world some day want? Indeed the world is already looking anxiously to the South to see if this future supply shall be forthcoming.

Among all the heavy field crops, cotton-growing today is the most remunerative; with a 13½ million bale crop in sight we are yet getting 11¼ cents for our upland short staples, 17 to 23 cents a pound for our upland long staples, 35 cents for our inland sea island and as much as 75 cents a pound is being asked for the fanciest grades of genuine sea island. There will in time be a heavy immigration of farmers into the South for the purpose of learning the growing of this King of the world's fields.

The South today is growing more cotton per acre than at any time in its past. Time was when two acres and most often three acres were required to grow one bale; today tens of thousands of hundred-acre areas will grow one bale to the acre or more. Better cultural methods of course are now used but this increase has largely come through the breeding of better and more productive plant types.

The cotton plant of our fathers scarcely had a name. Even the young of this generation can remember the time when the advent of David Dickson and Simpson cotton gave a beginning to cotton breeding. Today there are hundreds of types. The cotton plant of the past was large and limby and if it had 7 or 8 bolls per plant the owner was content. Today a plant numbers its bolls by the hundreds. The ordinary type of the old cottons had three locks to the boll, then came four, then came five, and today six bolls are being bred. In the past one boll to the joint was the maximum; then came cottons showing two bolls to the joint, and one type is being bred today which will give largely to the joint three bolls. In the old times if a cotton thirded itself at the gin, it did well; today we have types that turn out 43 to 45 lbs. of lint to the 100 lbs. of seed cotton.

While among the host of cottons now being offered under various names there must be many synonyms, yet there is a rapid increase of types that are really new. The botanist, plant breeder and farmer can find wide variance in cottons of today and they have at their disposal a large number of varying types.

We see infinity here as we see it everywhere else in the line of development; just what the cotton plant of the future will look like and how productive it may be, no one can know.

The great majority of cotton types have not come through any scientific or pollenation process. On the contrary a farmer on seeing in his cotton field an especially interesting peculiar and productive stalk of cotton can save the seed and continue to save it for a series of years, culling out each year the best, until he has produced a fixed type of high grade and in sufficient quantity to place it upon the market.

The writer has been asked by the editor of this paper to write in a series of articles, descriptions, both scientific and correct, of the leading varieties of cottons today as grown in the South. I shall begin with the upland small boll and medium boll cottons, taking next the big boll cottons; afterwards will come the long staples and last the sea island. First in the list, and I believe the best, is *Toole Cotton* (short staple). The lint is about 7-8-in. long, of the King type—that is, low bush, shapely, height, 3.73 ft.; 87 bolls make one pound of seed cotton. It is thus small boll cotton and is quite early. Alabama Experimenting Station reports 87 per cent. picked by September 7, not much later than Kings; can be planted 15 to 18 inches in row, two stalks to hill. It originated some half dozen years ago at Augusta. To-day three-fourths of the best planters in Augusta's territory plant nothing else. The cotton seems to be a cross between Kings and Peterkin. It is almost identical with Moss Improved Peterkin. It is earlier than Peterkin, and has somewhat bigger boll. It is shy on foliage, this scarcity of leaves that make shadow being largely in its favor. The seed is green-white with several per cent of black seed. The per cent of hull is perhaps the smallest of all cottons—a decrease in hulls meaning usually an increase in lint. A remarkable characteristic is that it gins from 42 to 45 per cent. of lint out of 1000 pounds of seed cotton; thus far outstripping a large line of cottons that only one-third themselves. This cotton deserves the widest adoption in the South. Many double joints are found in this cotton. It is far easier to pick than Peterkin.

There are numerous instances of producing three bales to the acre of Toole cotton. The Georgia Experiment Station reports, 1906, Toole Early as being first or head of list in yield of lint and seed value per acre. Alabama Experiment Station, 1906, reports Toole as first in total product per acre. South Carolina Experiment Station, 1906, reports that Toole led in both yield per acre and per cent. of lint per 100 pounds seed cotton at the gin. Clemson College Station says, 1906, "There is probably no other variety of cotton concerning which more inquiries have been made."

Moss Improved Peterkin originated several years ago in South Carolina. It has a medium boll, small seed, with high percentage of lint yield. Its height is 3.8 feet. Stood first, Georgia Experimental Station, 1902, and third in 1899 and 1900. It is a medium boll, and 83 bolls make one pound of seed cotton. The Georgia Experiment Station reports in this a yield of 44 9-10 pounds of lint in one hundred pounds of seed cotton. This is a phenomenal lint yield at the gin. While Peterkin has many lintless clean seeds showing black in color, Moss Improved Peterkin has eliminated the black or naked seed. This cotton is medium late, stands storms, is limby like Peterkin, fruits very closely, but with not quite so large a stalk as Peterkin. A little later than Toole. This cotton seems identical with Layton's Improved. Layton's stood first at the Georgia Experiment Station a year or so ago.

Georgia Experiment Station says of Moss Improved: "Seeds smallest of all; green 4 per cent.; naked 2 per cent.; percentage of lint, highest of all; bolls quite small; an excellent variety. There are few cottons in the United States today so good as Moss Improved Peterkin."

Peterkin—An odd type of South Carolina cotton. Branching, open growing, and prolific. Of late years a large percentage of Peterkin seed have slipped their lint and are smooth, bare and black. The yield of lint is about 40 per cent. at the gin. Peterkin fruits the whole season until late in the fall, its long roots going down deep; a partially dry season does not largely effect the crop. It is a tough, hardy and limby cotton, good for hard negro usage on poor and dry lands. It is often called "Negro Cotton" because it endures hard usage. Out of 38 cottons it ranked in 1904 at the Georgia Experimental Station as the most valuable. It is classed among the late cottons, and has a small boll. It requires about 100 bolls to make one pound of seed cotton. Indeed, it is one of the smallest bolled cottons known. Often times as much as 35 to 50 per cent. of the seeds are lintless and black. Around New Orleans this cotton is often called the "Black Rattler," because when shaken together the seeds rattle. The average height is about 4 feet. It invariably has several large limbs that branch out just above the ground, and this cotton, therefore, requires

plenty of room. On account of its black, lintless hulls the cotton oil mills who sell cotton seed hulls for cattle feeding purposes, are more favorable to other cotton seeds than Peterkin.

King's Early (Short Staple). Tolerably small stalk, pyramid shape. The earliest maturing cotton in the United States. Its habitat is the highlands of North Carolina, where the altitude and latitude both make a quick early maturing season. One hundred and three bolls make one pound of seed cotton. It lints about 38 1-2 pounds at the gin to the 100 pounds of seed cotton; 82 per cent. will be out about September 1st; averages about three feet high. This cotton opens in Texas about July 15th, and early in August in Georgia. It is quite prolific and quite frequently puts out a complete new top growth with full crop after the first crop has matured. The boll is small—as small as Peterkin. Seeds are very small and green-white. Much of this cotton has a red spot on the bloom. The old name of this cotton in its North Carolina home was and is "Sugar Loaf," named thus on account of its pyramid shape. This cotton has proved of great value in Texas in the boll weevil district, making its crop before the boll weevils have largely increased in number. It is invaluable, too, for planting after wheat, oats, beardless barley and Irish potatoes in all parts of the South. It is particularly a 90-day cotton. Wherever a short growing season is a necessity, King's is above all other cottons, the best.

DEMAND FOR COTTON YARN IN ASIATIC TURKEY.

Consul E. E. Young, of Harput, Asiatic Turkey, requests American spinning mills which desire to extend their foreign trade to send him samples of cotton yarns with lowest prices c. i. f. at port of Samsoun, on the Black Sea. He wishes to aid in increasing American trade in that region, and suggests that the proffered terms of payment to reliable local dealers be made as liberal as possible. German and French manufacturers, who control the bulk of the trade there in cotton yarns at the present time (importations of Harput district for 1906 amounted to about $85,000), grant three to six months' credit to reliable firms. Mr. Young does not state the class of yarns in demand, but the Bureau of Manufactures can furnish to interested mills samples of cotton yarn mostly in demand at Smyrna, Asiatic Turkey, viz.: Water gray No. 20, and water gray extra hard No. 18. The complete address of the consul is: American Consul E. E. Young, Mamouret ul Aziz, Harput, Turkey.

SOME DYE HOUSE SUGGESTIONS.

If a dye bath is becoming sour by the use of a standing kettle for direct colors, add a few pounds of soda ash to neutralize the acid.

To estimate roughly the number of gallons in a square dye vessel, get the cubic contents in feet by multiplying the length, width and depth. A cubic foot of water contains 6 1-4 gallons. The number of cubic feet multiplied by 6 1-4 gives the number of gallons.

Litmus paper should be in every dye house. Remember that blue litmus turns red when placed in an acid solution, and vice versa.

Epsom salts are preferable to common salt in the finishing and weighing of goods whenever formula calls for either one or the other.

When sulphur colors are used no brass fittings should be in the machine, as part of the sodium sulphide is oxidized into sulphuric acid; this in turn attacks the brass; only iron fittings should be used.

THE COTTON MILL INDUSTRY.

Probably few of our Southern people know that in the manufacture of cotton, South Carolina stands second and North Carolina third among the States of the Union, while Massachusetts, which is first, alone surpasses them.

W. E. Curtis, writing to the Chicago *Record-Herald* and quoting from official statistics, declares that if the extraordinary development that has been going on during the last six years continues, both will soon outstrip New England. Although the Southern mills do not make the finer grades of goods, because the operatives are not so skillful, most of the factories are new, they are filled with the latest patterns of machinery, and the most economical devices. For these reasons, because of cheap water power, and also because their raw material is grown at their very doors, they are saved transportation charges and can sell staple goods at ruling prices with a larger profit than the factories of the North.

Twenty-five years ago the capital invested in cotton mills in South Carolina was less than $3,000,000, and the annual value of the product was about the same amount. In 1905 the amount of capital invested in cotton mills in that State was $82,337,429, an increase from $39,259,946 for 1900, or 109 per cent in five years. Twenty-five years ago the mills of South Carolina employed 2,953 operatives. Today they employ more than 40,000.

Mr. Curtis notes that the development of the cotton industry in the South, and the other industries also, disclose several very interesting facts. In the first place, the number of manufacturing establishments in the rural districts is much larger in proportion than in the Northern States, and the proportion of factories in the cities and the great centers of population is much less. This is due to the distribution of labor. Nearly all the operatives in the Southern mills belong to the class known as "poor whites," and small factories are scattered throughout those sections of the states where this labor can be found.

This is a great boon to a large body of people who lived a precarious life, scratching a bare subsistence out of the rugged mountain sides, and having little facilities for schools, churches and social intercourse. Now they live in villages and small towns, that are gathered around the mills which are operated by water power, or by electricity which is generated by water wheels. These people have become wealth-producers and important members of society, whereas they formerly counted for little. The South's cotton industry is going to dominate the country before many years.—*Cotton and Cotton Oil News.*

We are in receipt of the following letter from C. B. Carter, Secretary and Treasurer of the National Association of Hosiery Manufacturers. Manufacturers who are interested should communicate with Mr. Carter.

Philadelphia, Pa., March 7, 1907.

COTTON PUBLISHING CO., Atlanta, Ga.

Gentlemen:—The writer has just returned from a three weeks trip West and South, and is very happy to report not only substantial progress in the way of securing new members, but also finds great enthusiasm among the mills regarding our coming Exhibition and Convention. The Convention itself promises to be one of unusual interest and will be attended by representatives from possibly 500 or 600 hosiery mills. For this reason manufacturers who cater to the hosiery mill trade have awakened to the importance of our Exhibition and are freely engaging space and preparing to make credible exhibits, thus demonstrating in a practical way to the delegates the merits of their machinery and product. Very truly yours,

C. B. CARTER, Secretary and Treasurer.

POWER PLANT OF THE FULTON BAG AND COTTON MILLS, ATLANTA, GA.

H. H. KELLY.

Probably few persons have a proper conception of the magnitude and commercial importance of the modern Southern cotton mill and of the gigantic proportions which these hives of industry have assumed during the last decade, but more particularly in the last four or five years. During the latter period important improvements have been made and the erecting of extensive additions has been constantly going on. Scarcely a mill can be found that is not now making additions or has not just completed important changes for the purpose of improving the quality of the product and increasing the output.

From an engineering standpoint, conditions in the cotton mill have been revolutionized within a comparatively few years. Slide-valve engines have given place to the Corliss and other four-valve types; simple Corliss engines have been replaced by compound condensing engines, and in several instances, the reciprocating type of engine has been replaced by the steam turbine.

The gradual, but constantly increasing, price of fuel and the introduction of multi-cylinder engines has rendered higher steam pressures an absolute necessity. This has caused a gradual change from the flue and return tubular types to the water tube boiler. Comparatively few modern mill installations are to be found in which pressures below 130 pounds are regularly employed; from 135 to 150 representing average practice, while pressures from 160 to 175 pounds are to be found in a few instances.

Condensing plants are the rule, and when mills are situated at some distance from a river or other unlimited supply of water, cooling towers are invariably employed.

The Fulton Bag and Cotton Mills of Atlanta comprise ten manufacturing buildings and an office building 45 x 60 feet, three stories in height. The area covered by these mills, including storage for coal and certain raw materials, is approximately 20 acres. The product of the mills consists of twines and bags.

The cotton spinning and weaving machinery in this plant is largely of an old type. The Draper Company has installed some of its new Model I looms, illustrated in Fig. 2. This new design is intended for use on the same line as the well-known E Model manufactured by this firm.

The changes in the new loom were made with the fundamental idea of allowing the use of a larger warp-beam to diminish the expenses attending the drawing-in of warps and the starting-up of new warps at the loom. Some of the incidental changes in this loom are as follows:

The sword can be removed without moving the rocker-shaft; the pick arm cannot hit the sword when the lug-strap breaks; the whip-roll can be set lower than on the old model and a larger pick-cam gives an easer pick. The entire shaft is of stronger design. The pick shaft boxes cannot move and the front box plates are secured by bolts.

Other changes are that there is more room for the cloth roll; that the loom has stiffer sides, larger feet and more weight and, in general, greater adaptability to modern attachments.

These mills represent 100,000 spindles and 2,500 looms, while the number of operatives employed throughout the year exceeds 2,000. For the operation of the vast amount of machinery in the various buildings, an aggregate of 3,750 horsepower is required at present, and when additions now being made are completed, a total of 6,500 horsepower will be fully utilized. Of the 3,750 horsepower at present developed, a little over 2,000 is furnished by a twin tandem compound condensing Cooper Corliss engine having 26-inch high-pressure cylinders, 48-inch low-pressure cylinders, with a common stroke of 60 inches. The speed is 60 revolutions a minute. The engine room is 45 x 60 feet, with a 12-foot basement of the same size, the floor of which is level with the ground; the condenser room 25 x 40 feet.

FIG. 1. EXTERIOR FULTON BAG AND COTTON MILLS.

Connection between the engine and the shafting on the various floors is made by means of four rope drives, the sheave carried by the engine shaft being 26 feet in diameter and 10 feet width of face. Drip pans are placed under the reciprocating parts and bearings and the oil conducted to 200-gallon filters located in the basement. The clean oil is delivered to an elevated storage tank, by a small duplex pump. From the tank oil flows through a simple system of nickel-plated piping to each of the bearings and the various sight feed cups.

Steam and exhaust piping is entirely below the engine room floor, the pipes being suspended from the steel floor beams, thus giving easy access to all valves and joints for inspection, packing, etc. The main steam pipe is 15 inches in diameter to a point midway between the cylinders where it divides, a 10-inch branch containing the throttle leading to each of the high pressure cylinders. Condensed steam is drained from the pipe and moisture removed from the steam by a Straight Line vertical

separator located near the wall where the main steam pipe enters the basement.

Exhaust steam is conducted through a 16-inch main to a combined surface condenser air and circulating pump located in the condenser room. The condenser was built by the Wheeler Condenser & Engineering Co., of New York. Cooling water is

FIG. 2. VIEW OF BATTERY CONTAINING BABCOCK & WILCOX AND NATIONAL BOILERS.

obtained from the storage reservoir in the base of a 20 x 32-foot fan type cooling tower. The air pump discharges through a 5-inch pipe into an 8-foot hot-well located near the cooling tower. The air-circulating fan in the tower is 8 feet in diameter and is operated at a speed of 220 revolutions a minute by a single rope drive.

Steam for the Cooper engine, the auxiliaries and for mill purposes, such as heating, drying, etc., is furnished under an initial pressure of 140 pounds by four Babcock & Wilcox and four National water tube boilers of 250 rated horsepower each, seven of which are required for regular service in summer, and eight in winter.

Feed water is obtained from the circulating-water discharge lines, and after passing through a 1,000-horsepower Excelsior heater it is delivered to the boilers at a temperature of 200 degrees by a 10 and 6 x 12-inch Worthington outside packed duplex pump, and a Dean duplex pump of the same size. These pumps are located in the condenser room and discharge into a 4-inch feed main from which 2-inch branches lead to the drums of the several boilers.

Draft of a little in excess of one inch water column is created by a brick chimney having an inside diameter of 8 feet and a height of 200 feet above the grates.

Steam is taken from the boiler drums through 8-inch long-bend leads, which are connected with a 15-inch main running across the tops of the boilers. The boiler room is 36 x 200 feet. Adjoining the boiler room, at the side, is a coal-storage bin having a capacity of 3,000 tons. This bin is normally kept filled, and by means of gated openings opposite each furnace, coal is automatically deposited within easy reach of the firemen.

The plat upon which the mills are located is some 18 feet below the main line of the Georgia railroad, so that cars are run in on a spur carried on a trestle of corresponding height. This permits hopper cars to discharge directly into the storage bin, thus avoiding all manual labor in connection with the delivery of coal. Suitable platforms are built beside the spur for receiving cotton and other raw materials and for the direct shipment of finished product.

The Cooper Corliss previously referred to furnishes power for four of the manufacturing buildings, the machinery in the remainder of the departments being driven by fourteen General Electric motors located at various points. Some of the motors are direct connected to the line shafting by means of flexible couplings, and others, belted to shafting. The motors range from 100 to 200 horsepower each and represent an aggregate of 1,575 horsepower. Alternating current, 60 cycles, 3-phase, is furnished under a pressure of 600 volts by two Curtis turbo-generators, of 500 kilowatts each, making 1,800 revolutions a minute.

At the end of the bay is the switchboard. The board is 26 feet long and contains 12 panels; four generator panels, four distributing panels, two for the exciters, one for lighting and

FIG. 3. 500 KILOWATT CURTIS TURBO-GENERATOR.

one for the curve-drawing instrument. The switchboard is of blue Vermont marble, and was built by the Walker Electric Co. of Philadelphia, Pa. Westinghouse instruments are used throughout.

Field excitation is furnished by General Electric 20-kilowatt steam-driven exciter units. Directly under the turbines are the oil coolers and equalizer units for supplying lubrication to the step-bearings of the turbines. The pumps are of the triplex type, with 2-inch plungers, and are driven by one horsepower direct current motors. These pumps maintain an oil pressure of 300 pounds per square inch.

In order to provide against a possible failure of the electrically-driven oil pumps, a 9-inch accumulator, weighted to produce 350 pounds per square inch, was installed. This serves

Fig. 4. 2,000 Horsepower Twin Tandem Compound Cooper Corliss Engine.

indirectly to provide sufficient pressure for maintaining the proper lubrication of the step-bearings. The accumulator is operated by a duplex steam pump, the speed of which is regulated, and the starting and stopping automatically effected, by means of a steel rope connected with the lever throttle and a weight on the head of the accumulator, the speed being governed by the rise and fall of the ram, which alternately picks up and releases the weight, thus operating the throttle lever.

In the basement are also located the condensing equipments for the turbines. These consist of two horizontal type surface condensers and twin vertical air pumps, built by the Stilwell-Bierce & Smith-Vaile Co. of Dayton, Ohio. The condensers, together with the dry vacuum pump, maintain a vacuum of 27½ inches. Lubrication of steam cylinders is effected by Rochester force feed lubricators.

Exhaust steam enters the condensers through short and direct connections. Circulating water is furnished at a temperature of from 80 to 90 degrees by a compound duplex pump placed in the sub-basement. This pump obtains water through an 18-inch suction main from the storage reservoir in the base of a 30 x 30 x 32-foot cooling tower.

Discharge water leaves the condensers at a temperature of from 112 to 120 degrees and is delivered into the top of the tower through a 16-inch discharge main. The air-circulating fans are four in number, each being 11½ feet in diameter. These are driven at a speed of 150 revolutions a minute by a 50-horsepower motor making 900 revolutions. The south bay of the engine room containing the turbines is traversed by a 10-ton electrically-driven traveling crane built by Pawling & Harnishfeger of Milwaukee, Wis.

Steam for the turbines and auxiliaries is furnished under 200 pounds pressure by three Babcock & Wilcox boilers of 335 rated horsepower each. The boilers in this battery are provided with superheaters integral with the boiler, 200 degrees superheat being obtained.

Fig. 7. The Weber Concrete Chimney, Showing Method of Construction.

Waste gases from these boilers pass through an American Mfg. Co. economizer placed above and at the rear of the boiler settings. The temperature of the feed water is thus raised to 300 degrees. Feed water is supplied by either one of the two pumps located in the condenser room, previously referred to. Draft for the high-pressure boilers is created by a tile chimney having an inside diameter of 8 feet and a height of 225 feet above the grates. Additional boiler capacity is being installed, together with a Weber steel-concrete chimney, which will be 8 feet inside diameter and 225 feet high. Draft for the high-pressure boilers is regulated by a Locke damper regulator.

Heating of the mills is done by means of Sturtevant hot-blast systems. This fan is 12 feet in diameter, 6 feet in width and runs at an average speed of 175 revolutions a minute during cold weather. Steam of 10 pounds pressure is used in the heating coils. The temperature of the mills is maintained at about 75 degrees. In order to provide against accident to the motor operating the fan, two means of driving it have been installed. The fan is usually driven by a 50-horsepower motor making 514 revolutions a minute, connected with the fan shaft by gearing. A Sturtevant engine is also provided, connection being made with the fan shaft by a belt and tight and loose pulleys. By this means continuous operation of the fan is obtained and the proper temperature of the mills assured.

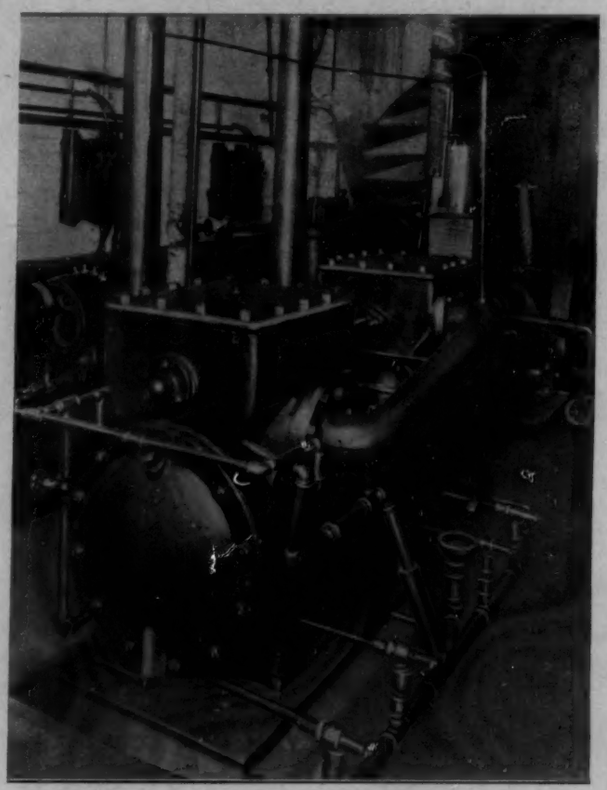

FIG. 5. GENERAL ELECTRIC CO. OIL COOLERS, AND THE DRY VACUUM PUMP.

Fire protection has been amply provided for. The sprinkler system, installed by the General Fire Extinguisher Co. of Atlanta is employed, which is normally supplied by a 150,000-gallon tank placed at an elevation of 125 feet. A reservoir containing approximately 250,000 gallons, is adapted to furnish an ample supply for two fire pumps located in the condenser room. These pumps are capable of maintaining a pressure of 150 pounds throughout the fire system. Each pump is also provided with two valves for hose connections. The steam lines leading to these pumps are continually drained and the cylinders kept hot and free from condensation, ready for service at a moment's notice.

Not the least important, as well as interesting, feature of this modern establishment is the machine shop. With the vast amount of high speed machinery, constantly in motion and taxed to the utmost in a vain endeavor to keep pace with the growing demands for finished goods, repairs of some character must be made daily. The equipment of the machine room is in keeping with the progressive policy of these mills. Modern machine tools are provided and labor-saving appliances are noticeable on every side. The equipment is sufficient and well adapted to take care of almost any repairs that might be necessary under the usual conditions of operation.

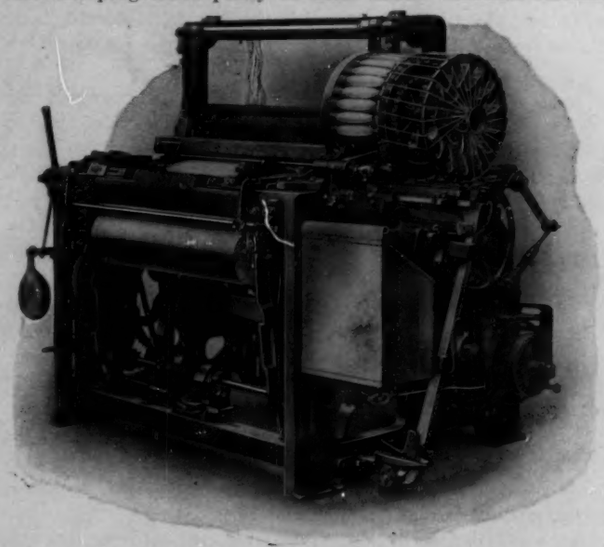

FIG. 6. DRAPER LOOM.

At one end of the machine shop is the stock room, and also the drafting room, where complete detail drawings are made for such repairs as require drawings and for new work of any kind about the mills. At the extreme end of the building is the engine room where power and light are furnished for these departments and light for other departments to the extent of 100 kilowatts. A direct current generator furnishes current of 115 volts potential for lighting purposes. It is driven by a 16 x 24 engine rated at 150 horsepower.

The Hardie-Tynes Mfg. Co., Birmingham, Ala., are setting forth in their announcements some pithy reasons why their Corliss engines are steadily finding their way into all parts of the United States, as well as into foreign countries, in competition with the products of the oldest and best known engine builders of the world. "Progress" is the Hardie-Tynes slogan. As noted heretofore, the company have established a sales agency at Yokahoma, thus planting their standard at the point where manufacturers of machinery in both hemispheres are engaged in a battle for selling supremacy, and sales already effected indicate that Hardie-Tynes engines have found favor with the nation whose appreciation of the value of details enabled it to gain the victory over Russia. It is stated that the company are preparing to make further strides along the lines of developing the efficiency of their engines to a still greater extent. John W. S. Jones, for many years connected with some of the largest engine-building plants of the North and East, and who enjoys a high and well earned reputation, has become identified with the mechanical department of the company; other announcements of importance, it is understood, are to be made in the near future.

THE ARLINGTON ANGULAR ROLLERS.

In the processes of bleaching, dyeing and finishing cotton fabrics, much difficulty is experienced in keeping the cloth free from creases, wrinkles, and double selvages.

When the goods are brought to the water mangle, it is important that they should go through the rollers in a smooth condition, for if they have double selvages and creases there is not only the liability of cutting the goods, but the mangle rolls themselves, are made rough, and require to be trued in the lathe more frequently than otherwise would be the case. Again, a double selvage which is hard pressed in the mangle, is more difficult to smooth out when the cloth goes to the drying machine or dye tubs.

If it is, therefore, important for the cloth to be smooth and free from wrinkles at the mangle; it is of vastly more importance that it should go on to the drying cans in proper condition, for a crease or double selvage which is dried makes it much more difficult for it to be smoothed out afterwards, and it sometimes will happen, on fine goods especially, a streak will remain in the finished goods to annoy the finisher, and to be made a cause for damage allowance.

To overcome the chance of these troubles is the object of the Arlington Angular Rollers. This little machine will not only smooth out creases and double selvages, but it will guide the goods into the middle of the machine before which it is set, and will prevent the cloth from running sideways.

It has taken the place of thousands of boys and girls in the bleacheries, dye works, print works, and finishing works in England, Scotland, Ireland, France, Germany, Italy, Austria, Russia, Spain, and in these United States of America.

It is used before drying cans, water mangles, open soapers, open washers, singeing machines, dyeing machines, etc., and is recommended for all positions where double selvages and creases are causing trouble.

The machine requires no attention, and no belts or gears, as it is driven and operated automatically by the cloth passing through.

The machine is sold by the Arlington Machine Works, Arlington Heights, Mass.

WAGES OF FOREIGN TEXTILE WORKERS.

The International Federation of Textile Workers, Manchester, Eng., reports the weekly wages of English operatives as follows:

Weavers	$4.86
Spinners	9.72
Cardroom workers (males)	7.29
Cardroom workers (females)	5.35
Beams	7.29
Bleachers	8.76
Bleachers (females)	4.37
Loom fixers	10.20

HOLLAND.

Spinners	$4.86 to $7.08
Cardroom workers	3.12 to 4.37
Weavers	2.40 to 4.05

DENMARK.

Spinners	$4.86
Weavers	$3.89 to 4.37

In Flanders, weavers running four looms earn $2.64 to $2.88 per week.

In Germany, Silesia, men weavers make $2.28, and women $1.68 per week, while in the best district, Central Franconia, the weavers earn $4.86 on four looms.

WASHINGTON, D. C.—Chairman Jenkins of the House Committee on Judiciary submitted a report, Feb. 6, in which it is stated emphatically that the committee is of the opinion that "Congress has no jurisdiction or authority over the subject of woman and child labor, and has no authority to suppress any abuses of such labor or ameliorate conditions surrounding the employment of such laborers." The committee holds that the regulation of woman and child labor is within the police power of the various states. The report was made in compliance with the resolution from the House Committee on Appropriations asking for an opinion on the subject before the committee included an item to cover the expense of the investigation of woman and child labor in the United States.

DESIGN OF TEXTILE FABRICS AND THEIR TEXTURE.

G. ALFRED HARBOUR, B. S., T. E.

In taking up this subject, it is best to divide it into two distinct parts: The Principals of Textile Design; and the Texture of Textile Fabrics. The first part may be considered introductory to the second part, containing as it does the manner of producing a fabric from yarns, the effects produced by various arrangements of these yarns, etc.

THE PRINCIPLE OF TEXTILE DESIGN.

All woven fabrics consist of two systems of threads which interlace each other at right angles. Those threads which run across the fabric in a horizontal direction are called picks, and the entire system is called the filling or weft; while those threads running vertically are called ends, and the system the warp.

The weaves of fabrics consist in the arrangement of the interlacings of one system with the other. There are two great divisions of woven fabrics as follows: First, one system of parallel threads intersects at right angles with another system of parallel threads. Second, the threads of one system, the warp, cross each other, or are twisted, in addition to being interlaced with the filling. This manner of weaving produces the leno, gauze or cross weaves.

Weaves are made in endless variety, after many styles of motives and figures, producing hundreds of thousands of different effects, but as in all sciences we are enabled to sift the various patterns met with in the textile industry to one of the two above divisions of woven fabrics, just as the chemist can sift compounds of intricate and difficult combinations to classes and orders when knowing the structure that separates them from all others.

The first mentioned system of fabrics is divided into a number of subdivisions which may be given as follows: Single Cloth, Double Cloth, Three and Four Ply Cloths, and Pile Fabrics.

The interlacing of one system with the other, or in other words, the different weaves are divided into three distinct main divisions known as foundation weaves, as follows:

1st. Plain Weaves.
2nd. Twill Weaves.
3rd. Satin Weaves.

The plain weaves have two systems of parallel threads interlacing each other alternately at right angles as in A, Fig. 1, which is four repeats of pattern.

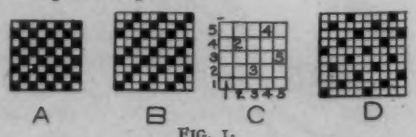

FIG. 1.

The designing paper here used is the square or point designing paper, the distance between two lines in a horizontal direction represents a filling thread, and the distance between two lines in a vertical direction represents a warp thread. Indications in the squares mean "warp up," and show where a warp thread is being held up while a filling thread passes underneath.

Fancy effects, such as stripes and checks may be produced by introducing into the warp and filling different colors. One may also produce fancy effects by introducing different size yarns.

The foundation weaves above mentioned are the foundation for all the subdivisions of weaves classified as derivatives. There are six derivatives of the plain weaves as follows:

1. Common Rib Weaves.
2. Fancy Rib Weaves.
3. Figured Rib Weaves.
4. Oblique and Diagonal Rib Weaves.
5. Plain Basket Weaves.
6. Fancy Basket Weaves.

TWILL WEAVES.

Twill weaves differ from the plain weaves. Instead of the two systems interlacing alternately, every successive pick interlaces with its successive warp thread. For instance, the first warp thread interlaces with the first pick, the second with the second, etc. By so doing it is possible to produce a distinct diagonal or twill line, across the fabric, as will be seen in B, Fig. 1. This is the simplest known twill, a one up and two down, (1+2). There are many derivatives of twill weaves, but the following will be mentioned as being those most frequently used.

1. Plain and Fancy Broken Twills.
2. Plain and Fancy Pointed Twills.
3. Plain and Fancy Skip Twills.
4. Steep and Reclining Twills.
5. Curve Twills.
6. Plain, curved, and figured cork-screw Twills.
7. Shaded Twills.
8. Entwining Twills.
9. Double Twills.
10. Checker Board Twills.
11. Fancy Twills.
12. Combination Twills.

SATIN WEAVES.

The characteristic feature of Satin weaves is, that they have a smooth surface without prominent lines like the twills. In order to give the surface this smooth appearance, the interlacings must be scattered about over the surface and interlaced at intervals of two or more threads. The more scattered the interlacings, the less the points will show. Those satins having the warp more prominent are called warp effects, and those having the filling more prominent are called filling effects. In designing satins we must decide how many harness we are to use and by the following rule find out the points of intersection.

RULE.

Divide the number of harness into two unequal parts, neither of which is a multiple of the other, nor must it be possible to divide either by a third number.

The numbers thus found are known technically as "counters", and are used as follows to produce the satin weave. Take one of them and add it to 1; then to this sum, etc., until all harness are taken up. For example, take the simplest satin, a five harness satin. Here one may have two counters, 2 and 3, they are unequal, neither is a multiple of the other, they are neither divisible by a third quantity. Taking 2 as a counter there results: 1+2=3+2=5+2=7 or 2+2=4+2=6 or 1, giving the ends which intersect each consecutive pick. This is illustrated in C, Fig. 1. Two repeats of the design are given in D, Fig. 1.

Under satins there are several derivative weaves which might be designated as follows:

1. Double Satins.
2. Plain and Fancy Granite Weaves.
3. Broken Satins.
4. Shaded Satins.

SPECIAL WEAVES.

Having finished the main points in regard to the foundation weaves without describing the manner in which the various derivatives are formed, it is sufficient to give a list (without describing) of special weaves which are dealt within textile manufacture:

1. Honey Comb Weaves.
   (a) Diamond Honey Comb.
   (b) Single Twill Honey Comb.
   (c) Double Twill Honey Comb.
   (d) Star Effect Honey Comb.
   (e) Square Effect Honey Comb.
   (f) Fancy Honey Comb.
2. Imitation Gauze Weaves.
3. Crape Weaves.
4. Huck Weaves.
5. Woven Tucks.
6. Crimp Stripes.
7. Warp Back Fabrics.
8. Filling Back Fabrics.
9. Pique Weaves.
10. Bedford Cords.
11. Double Cloths.
12. Three (or more) Ply Fabrics.
13. Pile Fabrics.
   (a) Velvets.
   (b) Plushes.
   (c) Corduroys.
   (d) Carpets, etc.

JACQUARD DESIGNS.

Jacquard Designing is a higher branch of designing, and is used where a great number of ends of warp are bound differently in the filling. The designs are painted at the discretion of the designer, using the different foundation weaves and their derivatives to produce the effects or patterns desired. This topic alone deserves a seperate article to fully cover it.

THE TEXTURE OF TEXTILE FABRICS.

By the texture of textile fabrics is meant the number of threads of warp and filling in one inch. The texture of a piece of cloth is one of the most important items which confronts the manufacturer, for upon its variation many things depend; for instance, the cost of finished product, or the appearance and utility of same.

The question of cost is of much importance, and is one of the main things which must be taken into consideration in varying the texture, the fewer ends and picks used, the less material and the greater the production. When the raw product is very high, manufacturers cut down texture as much as they possibly can and make up the deficiency in weight by filling the perforations with starch, flour, clay, etc. This is the case is some of the cheaper grades of cotton fabrics.

The design or weave is not the only thing which determines the length of the separate warp and filling floats, for as above stated the texture also enters into the appearance of the fabrics. It there are less picks per inch, the warp floats will be larger for the same weave, and if there are less ends per inch, the filling floats will be increased in length.

As to the appearance of a finished cloth or the length of the

floats, take the following examples of the effects of various textures of the plain weave. The warp and filling threads are of the same numbers, that is, they are of the same diameters.

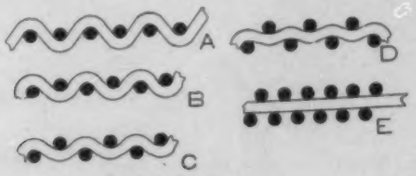

Fig. 2.

In A, Fig. 2, we have 45 ends per inch and 100 picks.
In B, Fig. 2, we have 48 ends per inch and 60 picks.
In C, Fig. 2, we have 50 ends per inch and 50 picks.
In D, Fig. 2, we have 60 ends per inch and 48 picks.
In E, Fig. 2, we have 100 ends per inch and 45 picks.

It is unnecessary to discuss the amount of bending which each thread does about the other, as this can be seen from the illustration. Special attention is called, however, to C, where the number of ends and picks is the same, giving the same amount of bending for each thread and each system of threads, this forms a theoretically perfect cloth, said to be balanced.

In weaving, there is a great amount of chafing or rubbing together taking place between the threads in the warp. Weavers subject the warp to a system of sizing, or starching, to strengthen the yarn, so that it may withstand the chafing. However, the texture has great effect upon this chafing. For instance, with a piece of goods having a high texture, there will be a great amount of chafing, and if the number of threads per inch is reduced, the chafing will necessarily be reduced.

Silk is the smoothest of the textile yarns, cotton next, wool is the roughest, worsted being next in roughness. It will be seen then that in a woolen fabric the texture must be low compared to cotton and silk, silk must be high compared to worsted and wool.

The direction and amount of twist also have great effect upon the texture. Unless carried to excess, the more twist put into the yarn, the smoother will be its surface, and the smaller the diameter. Of course, this reduces the chafing, hence one can make the texture high. It must be remembered, however, that the amount of twist must be regulated by the character of the finished fabric, for instance a cloth requiring a nap must be woven from filling with a comparatively small amount of twist.

The yarn used in the warp is sometimes twisted from left to right (forming right hand twists) shown at A, Fig. 3, and filling yarn is sometimes twisted from right to left (forming left hand twists) shown at B, Fig. 3.

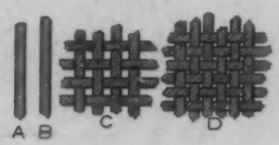

Fig. 3.

This is done for the reason that when these two yarns are woven together, the twist lines will appear in the same direction as in D, Fig. 3. This allows the threads to be pressed closer together for the strands fall into each other. In C, Fig. 3, will be seen the appearance of the twist line when the twist of the warp and of the filling is in the same direction. It will be seen that when the twist lines are opposite the designer is prevented using high textures. It is, however, used for some purposes.

The effect of direction of twist has a very important bearing upon the appearance of the fabric constructed on the twill and satin weaves. On account of this fact the twill line is either running with or against the diagonal twist line. This is why one side of a twill cloth has a finer appearance than the other; the twill running against the twist line gives a better appearance.

Attention was called to C, Fig. 3 above, it being a theoretically perfect cloth, the cloth is balanced. As the warp and filling are equal in diameter, there are the same number of ends and picks per inch, and each system bends equally about the other. We may use this as a basis and compare all other cloths as regards texture to this.

By changing the texture, using a small number of picks per inch, and using a different diameter for the filling, it is possible to change the appearance of the goods entirely, for instance, to get an effect which corresponds to the warp rib weave.

To produce a perfect cloth on the 2/2 twill, the texture must be higher than for the plain. In the plain weave, the filling intersects the warp alternately. Between the warp threads there is a space equal to the diameter of the thread, which is caused by the filling bending around the warp, in other words, the four threads, together with the four spaces, will occupy eight units. For the 2/2 twill, the filling intersects the warp every two threads, consequently, for the four threads there would be two intersections or spaces, then there would be six units for the four threads and the two intersections. Taking 50 threads per inch to weave a perfect plain cloth, using a certain count yarn, then to weave a perfect 2/2 twill using the same yarn, it would be necessary to use 66 2/3 threads per inch found by the followlng proportlons: $6:8::50:x$; $x=66\frac{2}{3}$.

The above is given as an example; by applying the principal one may find the proper texture for any twill, satin, etc., from the plain weave.

In finding the texture of a theoretically perfect fabric, it is necessary to find the number of threads that will lie side by side in one inch without interlacing. This is done by finding the number of yards per pound of the yarn in question. Extract the square root of this number and subtract the following percentages for various materials according to their roughness: Raw silk, 4 per cent; cotton, 7 per cent.; spun silk, 7 per cent.; linen, 7 per cent.; worsted, 10 per cent.; wool, 16 per cent. This will be the number of threads that will lie side by side without riding or interlacing in one inch.

From this the following table has been prepared showing the number of threads of cotton yarn that will lie as above in one inch from 5s to 100s (every 5 after 50s).

No.	Ends per Inch.	No.	Ends per Inch.
5	60.3	33	154.7
6	65.9	34	157.1
7	71.2	35	159.3
8	76.2	36	161.6
9	80.8	37	163.8
10	85.2	38	166.1
11	89.4	39	168.1
12	93.3	40	170.5
13	97.1	41	172.4
14	100.8	42	174.6
15	104.3	43	176.5
16	107.8	44	178.6
17	111.1	45	180.8
18	114.3	46	182.7
19	117.5	47	184.6
20	120.6	48	186.5
21	123.4	49	188.6

22	126.4	50	190.6
23	129.1	55	199.6
24	131.9	60	208.7
25	134.7	65	217.2
26	137.4	70	225.4
27	139.9	75	233.4
28	142.6	80	241.1
29	145.0	85	248.2
30	147.6	90	255.5
31	149.8	95	262.5
32	152.3	100	269.5

To find the texture of the theoretically perfect cloth, multiply the number of threads that will lie side by side without spacing by the number of ends in one repeat of the weave, and divide this product by the number of ends plus the number of interlacings in one repeat of the weave.

It is very seldom that actual fabrics have the same texture as the theoretically perfect fabric. The reasons for varying this have been stated before, namely, cost of finished material, appearance, utility, etc.

The more wear a fabric is subject to, the closer in construction the same must be. Fabrics for mens' wear must be made stronger than dress goods and must have a closer texture. Small twills, granites, etc., are generally used for this class of goods. In curtains the texture can be very low on account of the fact that they are not subjected to much wear, neither are they constructed for warmth. In ladies' dress goods the wear is not great, but manufacturers must use a texture which will produce the best effect as regards appearance. In overcoat fabrics, the wear is a small item in comparison to its power to produce warmth; hence, a high texture must be used to give the best results.

SPINNING AND WEAVING IN BELGIUM.

Consul W. P. Atwell reports that the city of Ghent is the principal cotton-spinning center of Belgium.

There are no less than 22 cotton-spinning mills. The number of spinning spindles in the Ghent mills alone amounted in 1905 to 704,223, while the total number of twisting spindles was 104,928. The number of spinning spindles elsewhere in Belgium amounted in 1905 to 351,424. The spinning mills of Ghent employ 80,000 to 100,000 bales of raw American cotton, and from 60,000 to 70,000 bales of East Indian cotton. The preference is given to the American article, but on account of its late high prices a considerable decrease in the quality imported is to be noted, while a marked increase in the importation of East Indian cotton has been registered. The grades of American cotton mostly in demand are the high grades, such as "good middling" and "fully good middling."

THE BUREAU OF STATISTICS announces that cotton and its products brought $425,000,000 into the United States from foreign countries in the year just ended. Of the cotton exported, $173,000,000 went to the United Kingdom, $190,000,000 to Germany and $45,000,000 to France.

MILL MEN ACQUITTED.

The trial of E. A. Smith and S. B. Sargent of Charlotte, N. C., recently held before Judge Boyd in the United States Court at Greensboro, N. C., ended in victory for the mill men. The counsel for the Government asked the court to instruct the jury to bring in a verdict in favor of the defendant in the case on trial and to make entries of a non-suit in the other cases and a nol pros in the case for conspiracy.

COTTON AND IMMIGRATION.

One of the chief arguments used against the stimulation of immigration to the South, is that the newcomers will devote themselves to the cultivation of cotton with a unanimity that will cause overproduction and a consequent depression in prices. It is contended, however, that the class of immigrants sought by the South are accustomed to truck gardening, and that they will follow these lines in their adopted homes, thereby developing an industry the neglect of which costs the South millions annually, and that they will, at the same time, offset the tendency of the native farmer to concentrate on cotton.

There is another phase to the matter, however, which the South will eventually be called upon to meet and solve—if it is to perpetuate its world-monopoly of crude cotton.

A year or two ago the very idea that the world would absorb a crop of 13,000,000 bales or more at an average price of 10 cents would have been scouted as ridiculous. Now the problem is, can the average price be kept down to the neighborhood of 10 cents, with the trade competing actively for all available cotton.

The New Orleans *Picayune* reviewing the enormous increase in the demand for cotton goods and the phenominal expansion of the mill industry, concludes:

It is a most wonderful development and the increase in the production of the raw material will have all it can do to keep pace with the growth of the manufacturing industry.

This increased consumption does not justify the Southern farmer in planting for a bumper crop. It does, nevertheless, point the lesson that in the years to come—not this year or next year or probably the year after that, but ultimately, the world's demands will be such as to strain the producing capacity of the Southern states—the only territory on the globe with the proved capacity to supply the nations with this all-embracing staple.

In what position then will the South be placed when, within the next decade, perhaps, the world will be demanding more cotton than we can produce because of a lack of laborers to till the fields, or because of the increased shiftlessness of the negro field-hand?

There need be little fear that an influx of immigrants will precipitate an overproduction of cotton. There are too many other profitable occupations to engage their attention. But will we not need the assistance of their children and themselves no less in the present than in that future to which we have pointed. when the advancement of civilization will have reached a stage putting a heavy demand upon the fertility of every Southern acre?—*Atlanta Constitution.*

THE COTTON PLANT.

"What a royal plant it is! The world waits in attendance on its growth. The shower that falls whispering on its leaves is heard around the earth. The sun that shines upon it is tempered by the prayers of all people. The frost that chills it and the dew that descends from the stars are noted and the trespass of a little worm on its green leaf is more to England than the advance of the Russian army on her Asian outposts. It is gold from the instant it puts forth its tiny shoot. Its fibre is current in every bank; and when loosing its fleeces to the sun, it floats a sunny banner that glorifies the field of the humble farmer, that man is marshalled under a flag that will compel the allegiance of the world and wring a subsidy from every nation on earth. It is the heritage that God gave to this people forever as their own, when he arched our skies, established our mountains, girt about us the ocean, loosed the breezes, tempered the sunshine and measured the rain. Ours and our children's forever, as princely a talent as ever came from his hand to mortal stewardship."—Henry W. Grady.

ENGLISH MILL CONSTRUCTION.

The English mill of today is up-to-date in all particulars if it be of recent build, and the older ones are as well equipped in most instances as circumstances will permit. There are many mills which have been in use for years. These cannot be made the equal of those of modern construction, but the owners are not slow in introducing the latest improvements.

Special Government Agent William Whittam, Jr., who sends a description of the present type of cotton-yarn mills in Great Britain, notes the enormous increase in the cotton spindles in Lancashire. As typical of the modern planned English mill he describes the Tulketh mill at Prestow, which has 101,832 spindles.

A combination of steel, iron, brick and concrete known as "fireproof" construction is now universal. The speeders in the card rooms, and frames in the spinning rooms, are placed across the mill, not lengthwise. The Tulketh mill is 333 feet long, 138 feet wide, with a height of 73 feet, aside from office, boiler house, and staircase projections.

The first or lower story is occupied by the conditioning cellar, waste cellar, and warehouse. Mr. Whittam calls attention to the fact that this "conditioning" of yarns might profitably be given more attention by American spinners. He says a British spinner would consider it suicidal, in a business way, to build a yarn mill without a room for this purpose, even if yarns spun be woven on the premises. The conditioning room is 194 feet long and 40 feet wide. This basement floor also contains the spooling and beaming departments.

The whole of the second story or card-room floor is taken up by the carding and preparing machinery, and contains picker room, 120 revolving flat-cards, drawing, combers for one preparation, slubbing, intermediate, and 56 roving frames.

On the third, fourth and fifth floors are the spinning rooms, having on each two pairs of mules and 30 ring frames, and giving a total of 91,032 mule 10,800 ring spindles for the three spinning rooms. These are distributed as follows:

Third floor, 6 pairs warp mules, containing 1,068 spindles per mule, and 6 pairs filling mules with 1,236 spindles to the mule. Extensive cotton warehousing space and mixing room with bale breaker and an elaborate system of distributing lattices are on this story. The fourth floor holds 5 pairs of warp and 7 pairs of filling mules, each having the same number of spindles as those on the third floor; also 30 warp spinning frames of 360 spindles each. The top or fifth floor has 7 pairs of warp and 10 pairs of weft mules.

A system of ventilation and humidifying has been adopted. The fresh-air inlet is placed on the ground level through the outside wall, and the air is propelled by a 12-foot fan through a revolving water filter, thus purifying the air of any dirt and humidifying it. In addition to the usual steam pipes in the rooms the fresh-air inlet is provided with a number of independent heating coils, so that humidity can be maintained at any desired degree.

The air is then distributed from subducts below the basement level by means of the iron columns of the mill into the different rooms, the columns being fitted with openings near the top, regulated by means of metal hoppers. The foul-air outlet is by means of flues built in the brickwork at several points from each room and carried up to the roof, and in the card room by continuous gratings in the floor between the rows of cards, and leading into a large flue below the floor. This exit is assisted by a large exhaust fan.

Instead of the somewhat usual arrangement of having a mill of this size confined to a few numbers of one quality of yarn, the management decided that it would tend to better results to lay the mill out in sections somewhat overlapping each other, so that should the existing difficulty in obtaining cottons of a certain grade continue they would be in a stronger position. Bales below standard will be used in the lower qualities and others above standard consigned to the mixing for the better qualities. Egyptian and American cottons will be used, and from American-grown staple 36s to 42s warp will be spun on the ring frames and 50s to 54s filling on mules.

This will occupy one-third of the spindles. The next section of one-third will spin 50s to 60s "super" carded Egyptian warp yarn (mule) and 72s to 84s filling of like quality. The last section will spin from combed Egyptian cotton 60s to 80s warp, 56s to 76s yarn for twisting, and up to 120s filling. It seems to have become the settled opinion of Lancashire spinners that from 100,000 to 120,000 spindles is the most economical unit for yarn mills in their area.

The engine house is a good and spacious building, measuring 84 feet long and 37 feet wide, with a height of 45 feet. The power is from a pair of horizontal engines of 1,600 horsepower, and the driving by ropes along a 12-foot race projection into the main rooms. The engine is fitted with an electric stop motion, by which it may be quickly stopped from any story of the mill in case of accident, or automatically by over-speed of engine or disarrangement of the driving ropes.

A novel feature also is that at the entrance to the engine house is a spacious vestibule at ground level containing electric-lighting plant as well as a powerful fire pump and other fire appliances. The condenser and air pumps of main engine are also placed in this vestibule, thus adding to the general effect. From this level springs an ornamental iron staircase to gain access to engine level. The walls also of this part of the engine house are tiled to the height of about 21 feet. There are two reservoirs for condensing purposes, holding about 2,000,000 gallons. An overhead traveling crane runs the length of the engine house, capable of dealing with any of the parts of the engine.

The boiler house stands adjacent to the engine house and contains four Lancashire boilers, each 30 by 8 feet 6 inches, and affords additional accommodation for a fifth boiler, if such were required. These boilers are fitted with superheaters, by which the steam is dried and raised in temperature about 150° F. above the temperature of saturated steam. The boilers are fed with soft coal by means of mechanical stokers, which automatically stop when the desired pressure of steam is exceeded, which movement also closes the dampers in main flues. There are also feed-water heaters, by which the feed-water is raised to about 300° F. before entering the boilers, and which is measured by a permanent meter to know constantly the efficiency of boilers and fuel.

The main staircase projects from the building and winds round a central well, three flights to a floor, from the landings of which are approached at different levels the toilet accommodations and a room where the operatives may obtain hot water. The staircase is carried up as a tower, carrying the water tank which supplies the sprinkler installation, and rises to a height of 125 feet above the ground. A cage elevator 12 by 5 feet connects each floor of the building.

Charlotte, N. C.—The first mule spinning plant to be established in Charlotte is being established by Geo. A. Howell of this city. The equipment will consist of two sets of cards, four mules of 1,280 spindles, and plant will be capable of producing yarn from 1's to 200's. It is believed that the machinery will be installed and in operation within 30 days. The plant will start with 50 horsepower, the power of the Southern Power Company being used. Low counts of yarn will be made at first.

ORGANIZATION OF WOOLEN AND WORSTED MANUFACTURERS, CONSTITUTION ADOPTED, REPORTS.

There are 115 members of the American Association of Woolen and Worsted Manufacturers. About 75 of these, representing the new American Association of Woolen and Worsted Manufacturers, met at the Aldine Club 111 Fifth Avenue, New York, on the afternoon of February 21, and adopted a constitution and put on foot other plans which will means vigorous work by the association.

The meeting was called to order by President Joseph E. Fletcher who in a few brief words stated that the Organization and Executive Committee had been at work during the preceding month drafting a plan of organization which would, it was hoped, materially increase the effectiveness of the Association in the purposes for which it was organized.

Following President Fletcher's remarks the report of the Executive Committee was submitted and adopted. The Committee stated that they had received numerous suggestions and that after considering all these they submitted the following resolutions:

RESOLUTIONS:

1. *Resolved,* That the Board of Directors be authorized and instructed to establish an office in the City of New York, and engage an Actuary.

2. *Resolved,* That the Board of Directors be authorized and instructed to institute a system by which members may report to the permanent secretary causes of unjust cancellation, unreasonable claims, and other unmercantile transactions which may arise in the conduct of their business. The Actuary to ascertain the facts in each case and prepare and present a concise statement thereof to the Board of Directors. If, after due consideration of any case so presented, the Board of Directors is satisfied that the member submitting the case is in the right, the Actuary to notify the customer at fault that unless the matter at issue is satisfactorily adjusted, notice of the facts of the case will be communicated to the members of the Association. And the proposed system to provide for the method of informing members of such cases as should be brought to their knowledge.

3. *Resolved,* That the Board of Directors be instructed to prepare a general plan of voluntary arbitration for settlement of trade differences that the members of the Association may have with any of those to whom they sell or from whom they buy.

4. *Resolved,* That the Board of Directors be authorized to establish a Credit Bureau for the interchange of credit information regarding customers. Such Bureau to be under the supervision of the Board of Directors; and the system to provide adequate respect and protection for confidential information supplied to the Bureau by the members; the expense of conducting it not to be paid out of the general fund of the Association, but to be defrayed by a separate subscription payable by those members who desire to receive the credit service.

5. *Resolved,* That the Board of Directors be authorized to have the Association incorporated and to adopt an official seal for the corporation, if, in the opinion of the Board, it is desirable to do so.

6. *Resolved,* That the Board of Directors be requested to prepare a uniform Order Blank for use in taking orders from customers; and a uniform Confirmation Bland for use in sending customers' confirmation of accepted orders. And that the Board recommend to all members the use of such blanks.

7. *Resolved,* That a general meeting of the Association be held prior to the opening of the Spring of 1908 season, for the purpose of considering any subjects that it may be desirable to act upon before the beginning of the new season. The time and place for holding such meeting to be determined by the Board of Directors.

8. *Resolved,* That at the general meeting proposed in the last resolution, the subject of selling sample allowance be discussed, with a view to establishing a uniform practice.

9. *Resolved,* That the Board of Directors be requested to prepare and submit, for the consideration of the next meeting of the Association, a statement of general conditions to govern the allowance of claims, such as the period within which a claim must be submitted, and whether any claims should be allowed after goods are sponged, processed or cut; and also as to the period, if any, during which customers should have the privilege accorded them of making revisions or cancellations of advance orders for a new season; and determining customers' liability for acceptance of sample pieces and so much as stock goods as may be already in process of manufacture, if cancellation or revision is permitted.

10. *Resolved,* That if a member reports a Public Examiner to the Board of Directors for giving a manifestly unjust certificate for the apparent purpose of enabling a customer to effect a cancellation, or to improperly reject goods, the Board shall make a thorough investigation through a committee of its members, and if convinced by the report of the committee that the certificate complained of was clearly unjust, the Board shall, through its secretary, notify the examiner at fault that unless the matter is satisfactorily adjusted, members of the Association shall decline to accept the certificates of such examiner in the adjustment of claims. If the complaint is not then adjusted in a manner which, in the judgment of the Board, should be satisfactory to the member concerned, the secretary to notify the members of the Association not to allow any claims based upon the certificates of the examiner adjudged to be at fault.

11. *Resolved,* That to avoid ambiguity and uncertainty in the use of certain trade terms, the Board of Directors be requested to give an official definition for the following terms commonly employed in sales of certain classes of merchandise: Sold as are; sold as seconds; sold as unmerchantable; sold subject to no claims.

It was recommended in submitting Resolution 2 that the Association inform the members of customers who were not dependable and take no further steps except that after the plan had been in operation as long as six months the Association should decide whether or not it would decline to accept orders from such customers.

The committee also stated in submitting Resolution 3 that the object of the resolution was merely to provide a prompt determination on matters about which there was dispute and to do away with the expense and delay incident to trials in the civil courts.

The Constitution was adopted unanimously.

It was decided that active members should have only one vote, and it was further decided to distinguish between the terms broad and narrow looms, 51-inch space being the dividing line.

ELEVENTH ANNUAL CONVENTION AND EXHIBIT, PHILADELPHIA, MAY 13-19, 1907.

We have received from C. B. Bryant, Secretary and Treasurer, a letter calling attention to the convening of the Eleventh Annual Convention of the American Cotton Manufacturers Association in Philadelphia, May 13-19.

COTTON wishes to call the attention of Southern manufacturers to this opportunity for profitable advertising and urges them to send in at once applications for space.

Space will be held for Southern manufacturers as long as possible but as freight movements on the railroads are slow, exhibits should be started to Philadelphia at once.

DYEING DEPARTMENT.

DYEING PARA-NITRANILINE RED.

The quantities used in the following receipt are for a set of cotton warps weighing 1,000 pounds. The preparing bath is made up as follows: In a barrel in which four parts of water, estimated on quality of chemicals, had been previously added, put in 25 pounds Beta Naphol, 8 quarts of a saturated solution of caustic soda and 8 quarts of sulphated oil (olive oil may be used). Add water and heat to boiling, then add cold water enough to fill the barrel.

The dyeing machine is then nearly filled with water, and contents of three-fourths of barrel is added. After the first run has been completed, the remainder in the barrel is put in. Enough space should be left in the dyeing machine before the first run to take up the quantity of the preparing mixture. As part of the preparing solution is left in the machine, it is replenished for another set of warps by adding 20 pounds Beta Naphol, 5 quarts caustic solution and 5 quarts sulphated oil, prepared as in the first instance.

On the second and last run in preparing bath, the weights should be so set as to squeeze all surplus liquor from the warps. The warps are then thoroughly dried as quickly as possible, and no water, steam or acid fumes should be allowed to touch the warps after drying, as it will cause spots on the yarn.

The developing bath is made up as follows: 3 small tubs or barrels are used which are numbered 1, 2 and 3. In number 1 put about 18 pounds of hydrochloric acid at 32 degrees T. W. Ice by first breaking up small pieces of ice, placing in barrel and stirring thoroughly, adding more ice as wanted. In tub No. 2 put 45 pounds of sodium acetate, and add a few pails of water, enough to dissolve thoroughly. In tub No. 3 put 20 or 25 pounds Para-Natraniline, using enough hot water to dissolve thoroughly. Then add 12 1-2 pounds of sodium nitrate; ice thoroughly and add cold water, three times the amount of this solution. To this add slowly the cold acid from tub No. 1, stirring continuously. One should use his own judgment as regards water to be used in smaller barrels, Nos. 2 and 3. The entire amount of the acid in No. 1 should be put in No. 3, usually with a small dipper. An excess of acid will cause the fumes to become obnoxious, if added too quickly. The dyeing machine is then almost filled with water, leaving enough space for the contents of the three smaller tubs. The sodium acetate is usually placed in the dyeing machine before the para solution is added and ice added. The amount of ice varies according to temperature, say an average of 200 to 250 pounds is used for this operation. Usually one-third to one-half is used in the preliminary work, and the remainder added to the dyeing machine. It is well to ice the machine thoroughly before adding the para from the small tub. After the machine is filled, it is well to take out a certain amount, depending entirely, of course, upon the size of the machine; say one barrel of dye liquor, and use same to feed on warps after the first run. There should be two runs in the machine, and two washings in cold water. After the last run in the wash water, the warp should be soaped by making up a new bath at 130 degrees F., with 20 pounds of soap added. Usually a cheap potash soap is sufficient for this class of work. The proportion of chemicals of course varies with the different dyes, as well as methods, the same as in all other classes of colors. It is essential that enough acetate of soda should be used to neutralize any surplus hydrochloric acid. Para is a color produced in an insoluble form directly upon the fibre. It contains the azo root (N-N-1) is chromophor and as auxo chromous groups, either as hydroxyl or amido group N. H. 2. It is a most useful red where fastness to washing is desired, and is used considerably for damasks.

DIRECT COLORS.

Since congo was discovered in 1894, the number of direct dye stuffs have increased to a remarkable extent until at the present day they almost form an endless number.

As surplus colors technically belong to this list, at the present day this class of dyes takes the foremost place for cotton dyeing.

From a chemical standpoint, direct cotton dyes are salts of color acids. Benzine is colorless, but by introduction of chromophorous groups, which in turn take up auxochromous groups, is produced a substance possessing tinctorial properties. Both groups should exist, and the chromophor has great tinctorial value if converted into salt derivatives. With the exception of sulphur colors, which require sodium sulphide to put them in solution, direct colors are soluble in water, with the exception of some which require alcohol, which years ago were spoken of as the spirit colors, such as some of the types of Victoria blues. Many direct colors vary as to their power of solubility, estimated on volume of water and quantity of salts added to dye bath. The nature of the water also effects them in view of the fact that most so-called hard waters contain calcium and magnesium tending to precipitate the colors in the form of salts. When such water is used, it should first be boiled. Water containing iron, as exists in the clay of some of the Southern states, would tend to dull the color, especially on delicate shades. Most mills, however, in those sections drill their wells to a depth far below surface water.

Common salt is the most prominent assistant, owing to its neutral nature and cheapness, from 10 to 20 per cent. of weight of stock being used. Its action in a dye bath is to precipitate the color. If an excess is added the color may be absorbed too quickly and uneven dyeings take place. Should it be necessary for the color to go on slowly, an agent is used such as soda ash or soap, which tends to retard the color. The most common salts, however, are the neutral salts, such as glaubers and common salt. On some colors, such as the sky-blues or other delicate tints, phosphate of soda is often used. Its price, however, keeps it from being more generally adopted. If a shade is produced by combination dyes, it is preferable to choose those colors whose degree of solubility is similar. Many mills buy a mixture; however, if the skill of the dyer will permit, it is much preferable to buy the straight primary colors and make mixtures therefrom. In this manner a lesser amount of dye stuff is required to be kept in stock, and usually much better results will be obtained.

A shade produced by laboratory tests is often changed when the same color is used in practical work, owing to the different application as regards temperature and volume of water used. One dye exhausts more fully than another. Sulphur colors seem to be more erratic in their behavior in this respect, possibly due to the fact that they are not so concentrated and contain substances in their manufacture which tend to cause this defect in comparative product sample tests. The additional chemicals used as assistants, such as sodium sulphide and soda ash, would tend to complicate matters, as soda ash will redden the color if used to excess. The phase of oxidation also enters in considerably. However, the skill in the manufacture of more concentrated products in later years and the experience in handling same has helped to overcome many difficulties heretofore existing.

Many direct colors are materially helped as regards their fastness to light and washing by after treating with bicromate of potash, copper sulphate and other metallic salts, from 2 to 4 per cent. being used in a fresh bath at the proper temperature. Formaldehyde is a useful agent, especially on some direct blacks and after treatment in a fresh, first bath with temperature of 120 to 140 degrees F., using 2 to 3 per cent., it exerts some fixing value, but its main function seems to be the washing off of the surplus dye stuff. Direct colors in which the methods of

coupling, diazotizing and developing, forms also an important part in textile application. In another column the article on Para-Nitraniline Red furnishes a good illustration of coupling. In fact, it is the only substance used in this sub-division. It is essentially the same as diazotizing and developing, except that the diazo compound is formed in solution on the fibre which afterwards combines with the dye. By the use of different developers, different shades are produced on diazotizable colors.

Direct colors find their most useful application on cotton. On wool they are of less value, as the acid colors are much cheaper; but on union goods possessing different mixtures of cotton and wool fibres they play an important part. On silk dyeing they produce many brilliant and fast shades with the aid of soap and phosphate of soda. Some dye at the boil while others are started in a cold bath, gradually increasing the temperature until shade is produced.

TEXTILE ANALYSIS AND DETERMINATION OF SIZING AND DYES.

Four pieces of fabrics weighing about four grams are used for this purpose, one being put aside. The pieces are boiled for about 15 minutes in a three per cent. solution of hydrochloric acid. If the liquid is deeply colored, it is poured off, and a fresh quantity of acid (3 per cent.) added and boiled. The pieces are now well washed and dried, first by wringing them in a piece of linen, then subjecting them to the drying oven. This treatment removes all the dressing, such as sizing, softeners or any other finish used and part or all of the dye. The three pieces left are now immersed for one or two minutes in a boiling solution of zinc chloride 1.72 sp.-grav., prepared by heating one hundred parts zinc chloride, four parts zinc oxide and 85 parts water until dissolved. The pieces are allowed to drain, then placed in water for some time, then washed in acidulated water (hydrochloric acid) and finally in pure water until washing gives no reaction with ammonium sulphide. The pieces are wrung in a strip of linen. This treatment removes the silk. One piece is now laid aside and the remaining ones treated for the separation of wool. This is done by boiling for a quarter of an hour in a 2 per cent. solution of caustic soda. Loss of water by evaporation must be made up by adding boiling water when necessary. The piece is now washed and dried, without rubbing, so as to avoid loss of tissue.

Next the four pieces are dried in the water oven for two hours and exposed to the air and in the balance case for one hour, then weighed. After having undergone the above treatment they are again weighed after exposure for two hours in a water oven and one hour in a balance case.

The difference in weight between the first and second pieces gives the sizing, the difference between the second and third gives the silk, and the difference between the third and fourth gives the wool. As the vegetable fibre is slightly attacked by the caustic, it is usual to add 5 per cent. of its weight to that of the cotton as the true weight. When the silk is dyed a dark shade it may be heavily weighted with iron, etc., in which case it is necessary to get an idea of the amount of weighting. For this, ignite a weighed piece of cloth which has undergone the first treatment. If the weight of ferric-oxide is slight it may be neglected, but if it reaches 5 or 10 per cent. of the weight of the cloth it must be taken into account. The ash of the textiles are sometimes examined for mordants use; for this purpose 5 to 10 grams of cloth are burned and the ash is examined qualitatively.

THE DYEING OF WOOL RAGS WITH LOG WOOD.

As grades of wool rags vary considerably as to their condition before dyeing, it is difficult to give an exact formula which will suit all classes of stock. Some grades after having been carbonized are heavily charged with muriatic acid, either in the dry or wet state, for the purpose of carbonizing the vegetable fibre contained in the rags. Under this condition is recommended the following method: For 100 pounds of stock, prepare a bath containing 8 to 10 per cent., estimated on the weight of the dry fabric, of an oxidized log wood; the commercial product hematine is usually the best article. Prepare a mordant in ether hot or cold water in a separate vessel with 2 1-3 pounds oxalic acid and 2 pounds of 58 per cent. carbonate of soda in sufficient water to dissolve the chemcals. Then add to this 5 pounds of sulphate of iron. When thoroughly dissolved, pour the mordant into the dye bath containing the solution of hematine. Then enter the rags and stir or move until they are thoroughly saturated, the bath being of boiling temperature. In a separate vessel put 1 1-2 pounds of soda ash in either hot or cold water and pour in half of last solution and continue boiling a half hour; then add the last half of soda solution. Continue to boil one hour longer. At the end of this time the bath is practically exhausted. If the rags are much acidulated, chroming is not advised unless the rags are first neutralized. It will require about 1 1-2 per cent. of soda ash. This will then evolve the additional operation of chroming after neutralizing. Should, however, the rags be in a neutral condition and the two bath operations be preferred, about 2 1-2 per cent. of weight of stock of bichromate of potash is used and bailed for one hour, afterwards thoroughly washing. A new bath is then made up in which 8 to 10 per cent. of log wood or hematine is added, previously brought to a boil together with about 1 1-2 per cent. of soda ash and dyed for 1 to 1 1-2 hours, or until the bath is exhausted.

When the usual log wood extract is used very good results are obtained, provided the stock is in an acid condition and carbonized by the dry process, by dyeing with log wood alone, from 10 to 12 pounds being used, bath brought to boil and stock dyed from one to one and one-half hours.

Proportion in all instances with regard to use of chemicals and extracts depends wholly upon the condition of the stock, and the dyer should use his own judgment. If the rags are to be saddened, put the stock in a bath for 30 minutes with 1 per cent. of copperas added and work slowly.

BLEACHING RAW STOCK COTTON.

Some mills, making a class of goods where the dyeing is done in raw stock, find it necessary to bleach a certain proportion of their stock. This can be done, to a certain extent, in a raw stock dyeing machine. The cotton is first boiled with sufficient water in which 2 1-2 to 3 per cent. of soda ash on weight of stock is added. Usually from one to one and one-half hours is necessary, depending of course upon the amount of stock in the machine and type of machine used. A new bath is made and cotton saturated with a clear solution of bleaching powder from one to two degrees T. W., and bleaching continued for two hours. Draw off and allow the loose cotton to drain for two or three hours; then wash and sour by treating with an acid at one-half to one degree T. W. A small amount of blueing, in wash water, is added, if necessary, to counteract any yellow tint. Wash hydro-extract and dry. It is best to make the bleach solution in separate barrels to a certain known strength by the use of the hydrometer and allow to stand for some time in order to obtain a clear solution.

China clay is a good substance for the weighting of piece goods, but has the defect of dulling the shade where most of the fabric is a solid color. A substitution should be made with dextrine or glucose, gum, epsom salts and zinc sulphate; the latter is a good antiseptic, preventing mildew.

INDULGENCE VERSUS OVERWORK.

MR. D. A. TOMPKINS OF CHARLOTTE, N. C., ON CHILD LABOR AND APPRENTICESHIP.

The following address by Mr. D. A. Tompkins of Charlotte, N. C., on the topic of "Child Labor and Apprenticeship," delivered at a recent session of the Civic Federation in New York, is worthy of careful consideration.

As this discussion progresses it becomes more and more evident that we have a difficult and important subject. I shall speak with reference to that phase of the subject which relates to the conditions in the cotton mills. It is important that some of the antecedent conditions which existed in the South be understood, in order that we may appreciate what is now going on in the present conditions. You all know about the Civil war, and you have in your minds that its end was a calamity for the South, but the most thoughtful of Southern people do not believe that the calamity was unalloyed. It ended the institution of slavery, and if the poverty that came was a calamity, the abolition of slavery was in turn a sufficient benefit to balance it.

But we had a subsequent period of so-called "reconstruction," which was a calamity such as was never before borne by a Christian people, and in which poverty became greater, and conditions more dark, than that in the time of, or as a consequence of, our war itself. Through a period of almost twenty years succeeding the war, the white people of the South sacrificed all else in the fight for Christian civilization, and while carrying on that fight there was no question of wealth, nor of anything but "hog and hominy" and "bacon and greens" to live upon. In that time one hand was on the plow while the other had to be held upon the sword. It was a twenty years' war, and out of it everybody came in absolute poverty. Every man, woman and child in the South was a veteran of that war.

The beginning of the cotton mill construction was the end of that period, about 1860-85; and this construction work has gone forward as a beneficience not alone for the owner, but for the operator—not alone for the owners and the operators, but for the farmer, who in the period of fake reconstruction, saw cotton go from fifty cents down to five cents a pound, and had to live upon that. Today the cost of making cotton is eight cents a pound, and it is selling, happily, at ten and twelve cents. The extreme hard condition of having to live upon the proceeds of cotton at five cents was relieved by the construction of cotton mills, and the farmer himself has begun to prosper simply because the cotton mill operatives have gotten out of competition with him on the farm.

At the beginning of the construction of the cotton mills, the amelioration of the former condition of the people who worked in them, and of the operators alike, began. That amelioration has continued to the present time, until now, we are just beginning to see the light of the beginning of new day.

Some gentleman asked, What ought the child committee to have done? What is recommended? What is our duty? As a Southern cotton mill man can see it, I answer: The mill managements having established or extended schools, having worked year after year for a compulsory educational law, having increased wages fifty to seventy-five per cent and having brought what seems to us all in the South, great prosperity, (certainly great by comparison with former times) out of conditions of deepest poverty, we feel that we ought to be allowed to go on in that same course. The methods used have brought about a condition in which the black man has an equal opportunity, and an open door to whatever this country brings to any of us.

I am not one who believes that we can do beneficient things altogether by law. Every Southern cotton mill man is bringing conditions as fast as he knows how to that condition which is desired by those who wish to see the age limit for the work of children up to fifteen years at least. I know that is my sentiment, but I don't believe we should undertake to do it arbitrarily and at once, but that we should continue to build up the educational forces, the social forces, the forces and the financial condition as in the past. I prefer compulsory education by which we will avoid exclusive laws which are always liable to become sumptuary and interfere with the liberty of the individual.

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We do not need any law on the subject of night work, because night work is almost at an end, and will be at an end at a very early date, in consequence of the influences which are already at work, some of which are economic and some of which are altruistic. In one business in which I am engaged, which is the machine business—I am engaged in cotton manufacture and in the machine business—in the machine business we have developed a system of apprenticeship in which we do not want to limit the age of the apprentice to be as high as sixteen, but we particularly desire that they be brought to us at twelve. This is not for the purpose of working them for profit, but it is for the purpose of education. Our latest contract requires that the apprentice shall go to school six months in the year and then he may work four months in the machine shop ten hours a day. This young apprentice's work consists in waiting upon the machinists. He gets waste for them and takes their tools to the blacksmith shop for repair and does other errands and light work. We are considering putting it in the contract that he must spend one month of the year in the country and we expect to pay the board on the farm of those whose parents cannot afford it.

As long as men are greedy men there will be need ultimately of some law to set a limit to the overwork of children which cannot be eliminated by better motives. And also as long as there are tender hearted women, there will be sentiments that are liable to injure children as the tender mother so often spoils the child. I believe there are just about as many children spoiled by indulgence as there are by overwork.

As long as there are greedy men, we have got to protect children from overwork by them; and as long as there are people of excessively tender hearts, we must do the best we can to protect the children from excessive indulgence.

I can recollect the first time I ever went 'possum hunting and stayed all night. When I got back in the morning, my mother was in a great state of mind and wanted to know where I had been. I told her, "In the woods, hunting 'possums." "Didn't you sleep any?" "Oh yes, we raked up some leaves and built a fire and slept from 11 o'clock until four. The darkies said the 'possums would be walking about 4 o'clock." "Well; you slept out there with the negroes?" "Why, certainly, yes; and that was not the worst of it, the dogs were in the bunch also." There is a great deal that a boy wants to do and is bound to do that we worry ourselves about unnecessarily. There is a lot of this child labor talk based upon misconception of the subject very much as the hen misconceived the situation of her young ducks in the water. Light work, in my opinion, is not bad for children, but on the contrary it is good for them, and we ought to take them earlier, determine upon an apprenticeship, as I have endeavored to do in my machine shop, and incorporate with their education an early knowledge of what work is.

This matter of looking after the welfare of humanity and its education has been carried by Germany much farther than it has been by the people of the United States. In their common schools, when the child reaches ten years of age, it is desired that it be determined what the child is going to do,

what sort of education that child is going to have, and for those who will be engaged in industrial pursuits, the further education is not differentiated with respect to scholastic and technical teaching; but in many cases it is required that a certain amount of manual training shall be done, not from 12 years of age or 14, or 15, but from 10—and I am right with the Dutch in their ideas about the proper way to educate children.

One difficulty I find in handling an apprentice system in a machine shop is, that a lady will come to me—a mother or an aunt—with a fine fellow that she wants to have learn the machine business, and when I ask, "How old is he?" the reply often is, "19 years old." "Well," I have to answer, "he is too old; you ought to have brought him when he was 12."

The subject is the more difficult because we cannot make rules. If I do not need laws in the machine shop, it is because the boys that I deal with have already been so educated by home training and practical teaching that it makes laws unnecessary. I couldn't abuse those boys if I wanted to. My own shop would revolt; the journeymen would revolt. In the cotton mill business I desire to see the least possible legislaton that is liable to become sumptuary, and infinitely more attention given to the subject of raising the social and moral condition of this whole people. If we could get a little more help from the child labor committee or anybody else on the phase of the work of betterment, it would be very highly appreciated and would be useful, whereas in many cases the agitation is doing positive injury, neglecting altogether, as the agitators do, consideration of what we are going to do with the child when legislated out of the mills, out of one of the easiest occupations that could be found and from a condition in which he has already been rapidly advanced.

In the course of time we will elevate this calling of spinning and weaving. At present, most people think of those employed in the cotton mill business as being employed in a place in which common white cloth is woven and laboriously turned out without the exercise of a particle of brains—and unhappily it is too much that way; but the more profitable business will always carry it toward a better understanding of work-people come to an appreciation that weaving is an art which can be carried as high as any of the arts, not only in the production of well-designed carpets, and fine carpets, in the production of well-designed lace curtains and fine lace curtains, but of fabrics even finer than these, and ultimately of tapestries which are works of art, why should we think so much about legislation that is liable to become too soon sumptuary and interfere with the higher development of which I speak?

Dr. Joseph LaConte, one time professor of chemistry in the South Carolina college, and later professor of geology in the University of California, said that the highest attribute of the white race was its capacity for training, both physical and mental. Christian civilization is founded upon the fact contained in Dr. LaConte's statement that the white race can carry its training farther than that of any other and maintain it longer. The extent to which it may be carried is practically unlimited.

Whatever we do in the way of legislation against child labor for profit, let us not forget that we have a large duty to see that the child, when legislated out of the mill, shall not be left wholly idle and untrained, but be mindful to provide enough work in school and in some apprenticeship condition to develop a decently trained and educated man or woman, and, with these conditions, raise the age of labor for profit to 15 or 16 years. Instead of enacting laws which totally expel children from that training so essential to their better development as men and women, let us leave the way wide open for both teaching and training—each in proper proportion—and so make our laws as to stimulate mental and physical training in proper degree, while in childhood and youth.

It is in the period of childhood and youth that the faculty of mutual and physical development may be made most fruitful of permanent results. Eight years used to be considered a tender age for the child to start to school. Now the cry of the teacher is to get the child younger, and it is not uncommon to see three-year-old infants regularly enrolled in the kindergarten. By this means the child may be brought at eight years to a fair degree of elementary education and under proper care the child is strengthened both physically and mentally. It transpires that the welfare of children means decreasing the school age and not increasing it.

As in the school, so I believe it should be in the factory. The practical training should be begun while the pupil is yet young. It should of course be guarded at every point to prevent the use of the child as a laborer for profit up to as high as 15 or 16 years, but work in the capacity of apprentice should begin earlier rather than later in life. I have thought that some such graded schedule of apprenticeship work and school attendance might well be authorized and controlled by law for boys and girls in textile pursuits.

From 11 to 12 years three months' work in a textile factory may be allowed, but only after an attendance at school of six months.

From 12 to 13 years, four months' work in a textile factory may be allowed, but only after an attenance at school of six months.

From 13 to 14 years, four months' work in a textile factory may be allowed, but only after an attendance at school of five months.

From 14 to 15 years, seven months' work in a textile factory may be allowed, but only after attendance at school of three months.

From 15 to 16 years, ten months' work in a textile factory, but only after attendance at school for two months.

But what is the use of the law without first developing this system? I state as a fact that the system is well under way in the Southern cotton mills, that it has been under way since the first mill was built after the Civil war, and that betterment is progressing today in Southern mill towns at a rate greater than the educational system of New York City is.

Now, what we want is not controversy. It does not matter whether the figures that have been given by magazine and platform reformers are correct or not; it matters not whether a picture of a loom has been published showing a bedraggled child at it, when no child ever did work at a loom either in this time nor any other time. From time immemorial it has been the custom in the family for the young unmarried women to do the spinning and for the elders to do the weaving. Today, as of yore, the younger people do the spinning and the elders do the weaving. A child cannot weave, and therefore the picture is totally misleading.

Some of the figures that I have had in my hand were quoted by Capt. Smyth, and some of the figures which were made by the child labor committee have been taken back or so modified that I do not think that there are many figures to argue about. But the Southern cotton mill men want to have you realize that we believe that we are doing right. The effort to help the operatives began at a time when everybody in the South was on absolutely the same level of poverty. Leaders were not elected but were chosen by a process of natural selection, as in the days of the reconstruction, when the man on horseback led because he was the right man for the place.

Immediately after the reconstruction anarchy was ended, the

man who undertook to build a cotton factory was simply put forward, many times without his consent, to help do the most promising thing looking to amerliorating the condition of the people in the country. The warm ties of friendship and of affection and love which had been generated during the period of reconstruction—of absolute poverty and equality—made every man desirous of doing as much for his operatives as for himself. In this work of real reconstruction there came from unexpected sources much help, and it is to the eternal credit of the New England machinery builders that they gave liberal and long credit to the South, and the New York banker also gave us long and liberal credit; and it was largely upon the basis of that help that a beginning was made and that usecess has been brought out of an industrial development and will continue to be brought to a still larger growth for the infinite betterment of the humanity of the South and the Nation.

THE COTTON PLANT.

It commences way down there in Texas. You'll look down the rows and see the black soil being pushed up today and tomorrow you'll see the soil thrown aside as if a miniature earthquake had run down the row from one end to the other, and in its place you will see a long ribbon of green, and that's cotton; and every inch of that green ribbon will be worth hard money to the farmer later on and to the spinner and to the buyer and lots of little "niggers" and little Chinamen and little Japanese and the black citizens of the Congo and the cigarette-smoking Cuban and his cousin of everywhere will be adding some inches to their night shirts because of that little ribbon of green, provided the sun shines and the rains come in due season.

If you'll follow up the season you'll find later on other little ribbons spreading over the surface of Mississippi and the red hills of Georgia and the level stretches of South Carolina and getting the North Carolina Scotchmen out in early morning and crowding the trenches around Richmond; for cotton is a good worker and wants only a chance to "come across" and deliver the goods.

It works a whole lot of hours during the day and if the season is favorable it works several hours at night. It knows what it has to do. It's got mortgages to raise and children to feed and clothe and educate. It's got to give work to several hundred thousand men, women and children on the farm and in the mill. It's got to keep several associations going; it's got to keep the railroads and steamships and compresses and gins busy, so it keeps on growing at night as well as by day. If it only has a chance it will make good all right.

It's a vigorous little scamp and with the early dew on it it smiles at you and promises all kinds of things later on. And later on it puts out some pretty blooms for you to pluck—blooms which change with the passing of the day, and when the bloom is gone it smites you on the shin as you walk through it with close-packed bolls and while you stand in the midst of it as the July and August sun throws your shadow blackly on the ground it quits promising and fulfills. It opens up the bolls to you and shows you what it has been doing all the long summer. It puts wealth in your hand. It says, "I'll help you to build that palace you've been thinking about. You can go ahead. You've been doing some dreaming this summer but you needn't dream any longer. Get out and lay the foundations."

Wherefore—we call it KING.

It is reported that Frank Head, of Nashville, Tenn., has submitted a proposition to organize a $25,000 stock company for the purpose of erecting a cotton mill in Americus, Ga.

THE 1906-7 COTTON CROP.

The American cotton crop for the season of 1906-7, as compared with all previous crops, is a bumper yield and yet it is not of sufficient size to be burdensome. From the first bale marketed to the present time, it has moved from the plantations to the mills at a pace that has surprised the trade and in greater quantities than the railroads in the belt have been able to move it in a manner satisfactory to purchasers.

Despite this heavy movement, heretofore an influence making for a very low average price, the raw material at no time during the present season has shown decided weakness. All efforts to break prices to a level below the views of the producer have failed, due entirely to keen competition for an estimated bumper crop, indicating that consumption is keeping pace with the increase in production, though prices are yet below the basis on which spinners are under contract for goods extending well into the coming year. A decrease in the movement, however, would soon remedy this, and for the remnant of the present crop much better prices could be obtained.

In the Lancashire district new mills for the manufacture of cotton cloths are springing up. Nearly twenty new mills have been begun the present year. During the past seven years more than a hundred have been established near Manchester. These new factories, together with a large number of extensions and additions to existing mills, when fully completed, will have increased the manufacturing capacity of this district by 10,000,000 spindles.

New mills have been built and additions have been made to the old mills in the North and the South.

The increase in spindleage in the Lancashire district is attributed to the estimates of a record American crop this year. The year 1905, the previous record breaking crop, witnessed the greatest boom to British spinning in recent years, forty large factories having been added in that year, against only two mills in 1902.

This advice, dated from Manchester March 9, is the real influence governing the price of cotton at the present time.—*Georgian and News.*

ENCOURAGING SILK GROWING IN BRAZIL.

Exemption from all duties is provided for the eggs of silkworms, and by a further special provision all machinery, instruments, and apparatus required for silk factories and sericulture are to be admitted free of duty. The experiment of Brazil in silk culture merits the attention of the silk interests of the world. The climate is in general favorable to the growth and care of the silkworm, and apparently there is no reason why an abundance of proper food should not be had. Some parts of the country unquestionably may be considered among the most favorable locations in the world for silk growing. But the great element of silk culture is that of labor, and labor in Brazil is scarce, high-priced, and not always efficient.

Several years ago a notable effort was made to introduce the culture of the silkworm in several of the southern states of Brazil, but the experiment failed on the whole at that time for lack of labor. It may be well to consider, however, that one of the chief elements in the emigration from Europe to these southern states at the present time is Italian, and it is altogether possible, if not even probable, that silk growers trained in Italy may transplant their knowledge and industry to Brazilian soil. While labor is the chief element of silk production, it can be and generally is the labor of women and children, and it is altogether probable that the women and children of the peasant class in southern Brazil will take to the work if encouragement is offered them and steady markets for their products had.

CAN ITALIANS DISPLACE THE NEGRO IN THE COTTON FIELD?

For years it has been the mental habit of the American people to associate cotton production with the idea of negro labor. This is true to such an extent that most people are under the impression that practically the entire American cotton crop is the product of negro toil. As a matter of fact, more than half is raised by the white man. The inability of the negro, thus far, to hold his own in competition with the Northern white man has been demonstrated so often, and in so many ways, that it is no longer a debatable question. The fault is divided between the labor union, Northern economic race prejudice, and negro inefficiency. I believe that it is through immigration that the South is to realize the ultimate development of her almost untouched resources.

It is now more than a quarter of a century since Frederick Douglass risked his reputation as a prophet on a prediction based upon the economic dependence of the South upon the negro. In an address on the "Kansas Exodus" he declared that:

Only a few years of non-tillage would be needed to give the sunny and fruitful South to the bats and owls of a desolate wilderness. From this condition, shocking for a Southern man to contemplate, it is now seen that nothing less powerful than the naked iron arm of the negro can save her. For him as a Southern laborer there is no competitor or substitute. The thought of filling his place by any other variety of the human family will be found delusive and utterly impracticable. Neither Chinaman, German, Norwegian, nor Swede can drive him from the sugar and cotton-fields of Louisiana and Mississippi. They would certainly perish in the black bottoms of those States if they could be induced, which they cannot, to try the experiment. Hence it is seen that the dependence of the planters, land-owners and old master-class of the South upon the negro is nearly complete and perfect. He stands today the admitted author of whatever prosperity, beauty, and civilization are now possessed by the South, and the admitted arbiter of her destiny.

It is rather singular that in his enumeration of races incapable of competing with the negro Frederick Douglass should have overlooked the Italian, though his words are wholly without foundation as to those he mentioned. It is very largely the Italian who has deprived the negro of so many occupations in Northern cities, and it is the hardy, thrifty, tireless peasant of the same race who is to-day, in the sugar and cotton fields of Louisiana, Arkansas, and Mississippi, furnishing proof that Douglass was a better orator than prophet.

But it is the Italian cotton-grower to whom I wish to call attention here, and to what is probably the most important colony of these people now in the Southern States. This is the Sunnyside colony, in Chicot County, Ark., on the Mississippi River, nearly opposite Greenville, Miss., and between Memphis and Vicksburg. The chief claim of this colony to importance, in any consideration of American Italians, lies in the fact that among them all it has been the most widely advertised as a failure, while in truth it is outranked by few, if any, as a success. I have been familiar with its history since its foundation, and when I began the preparation of a paper on the negro's economic future it was to Sunnyside that I at once turned, as to an object lesson illustrative of the possibilities of white competition with the negro in the latter's ancient and strongest field.

This colony had its inception in a plan of the late Austin Corbin, of New York, to sell to Italians a large body of cotton land in Arkansas.

I was acquainted with the ups and downs of the original colony, and had read many accounts of its failure.

It was in 1898 that the Corbin estate entered into a business agreement with Messrs. O. B. Crittenden & Co., cotton factors, of Greenville, Miss., under which that firm assumed entire charge of the property. For the first time since Austin Corbin's original purchase the business of planting cotton on Sunnyside was in the hands of practical cotton-planters, rather than under the control of very excellent civil engineers from New England and the North. When Crittenden & Co. took charge there were 38 Italian squads on the place, with 200 working hands, cultivating 1,200 acres of cotton. There were 203 negro squads, with 600 working hands, cultivating 2,600 acres of cotton. At the end of 1905, after eight years, the cotton acreage had increased to 3,900 acres. Of this we find 900 acres cultivated by 38 negro squads, with 175 working hands, while 107 Italian squads, with 500 working hands, cultivated 3,000 acres. The change in the relative numbers of the two races has been accomplished through entirely normal processes, and therein lies the real secret of the success of the new colony upon the identical ground which was the scene of the failure of the old. The average plantation negro in this section of the South is constantly shifting his base. The paramount difficulty is that of securing reliable tenants. The Italians who were on Sunnyside in 1898 did so well under the new regime that they not only remained themselves, but of their own volition sent to Italy for their families and friends. When the negro moved out an Italian moved in.

The figures for the first year were not obtainable when I made my investigation, and the year 1905 had not then closed. Hence the period covered was for six years, 1899 to 1904, inclusive. During these years the Italians made an annual average of 2,584 pounds of lint cotton per working hand, and the negroes an average of 1,174 pounds. The average lint production per acre was for the Italians 403 pounds, and 233 pounds for the negro. The average cash product value (cotton and seed) was $277.36 per hand for the Italians, and $128.47 for the negro. These values per acre were for the Italians $44.77; for the negro, $26.36. The Italian produced 1,410 pounds more lint per hand than the negro, equal to 120.1 per cent., while he raised 170 pounds, or 72.9 per cent., more lint per acre. This represents a difference in money value, including cotton-seed, of $148.89 per hand, or 115.8 per cent., in favor of the Italian, and of $18.41 or 69.8 per cent., in value per acre. The Italian cultivated 6.2 acres per working hand, and the negro 5.1 acres.

Stated briefly, the Italian saved and the negro did not. Of the 110 Italian squads who began crops in 1905, 44 were new arrivals. Yet of the total number, 65 squads, or 59 per cent., made no accounts for supplies during the year. This means that practically all those who made crops on the place in 1904 brought themselves to a state of independence for 1905. In 1905, 61 negro families began crops on the property, of whom but two, or 3.2 per cent., were independent. We may understand this better when we know that to the 66 Italian squads who made crops in 1904 there was paid in cash balances above all accounts the sum of $38,764.58, an average of $587.75 per squad. In 1904 there were 110 negro squads on the place, and of these, two drew balances amounting to $480.50, while more than $6,000.00 had to be carried over for the others, or charged off to profit and loss. The net result of these operations may be illustrated in another way: At the end of 1905 there were 107 Italian squads, and of these 104 owned 123 head of work stock, and other live stock in addition to the total value of $23,400. Only three squads out of the total number owned no stock. At the close of 1905 there were 38 negro squads still on the property, and of these 21 owned stock to the value of $3,360, while 17 had nothing at all. Expressed in percentages, only

2.8 per cent. of the Italians failed to share the community prosperity, while among the negroes 44.7 per cent. found themselves in this condition.

There are many queer illustrations of the traits which lie behind the showing made by these transplanted children of sunny Italy. Some years ago, under the old regime, I was making a trip over the property, on the plantation train, with the resident general manager. We saw an Italian some distance ahead of us wildly signaling for us to stop. In an excited tone, and in broken but clearly intelligible English, he told the manager that he wanted the trains to discontinue until he had gathered his crop. It was then only August, and he had not even begun to pick. It was out of the question to comply with his demand, but he soon made us appreciate the ground of his complaint. With infinite pains, and evidently at the cost of much careful work with his hands, he had planted and cultivated cotton between the projecting ends of the cross-ties, right up to the rails. This cotton was now tall enough to be swept by the cars in passing, and he wanted an end put to the nuisance which promised to damage his crop. It was explained that the railroad right-of-way was not his. He replied that he had been told that his land extended to the track, and he had simply planted accordingly. For my part I thought he should have been reimbursed. Such an example should not have gone without its reward. They planted on Sunnyside the banks of streams which had never before known the touch of a plow. They plant ditch banks and fence rows with equal care, and cultivate every square foot of soil on which they are paying rent. —*Review of Reviews.*

VALUE AND DANGERS OF SHODDY.

This is a substance whose very name is a byword for all that is worthless; yet it is a valuable and important item in industry and objectionable only when it figures as something else. It is estimated that every month England exports between five and six million yards of this article, which is made from rags, torn up and rewoven. It has been stated that from 1,000 to 1,400 tons of wool rags are used in Yorkshire every week.

"Rags are ever an object of suspicion as possible carriers of infection, and the import of rags from places where infectious diseases are epidemic is frequently forbidden. F. W. Reuss, an authority quoted in the Literary Digest thinks that these precautions are unnecessary, and declares that it had never yet been proved that a rag of any kind had conveyed infection. Some sanitary scientists have discust the question, and have come to the conclusion that there has never been a case of disease carried from one place to another by means of rags. It has been suggested that the existing restrictions on the importation of rags is a subject for complaint. Yet, because shoddy is such an important manufacture—for if it did not exist the poorer classes would be unable to get changes of upper clothing as frequent as is for health's sake desirable—it is important that these rags should be beyond suspicion. The confiscation of a few bags of rags is less serious, even to manufacturers, than the loss of webs of the stuff into which these rags are woven, and infinitely less serious than the risk of spreading disease. An epidemic traceable to the wearing of shoddy would damage the whole industry most severely.

WESTINGHOUSE ELECTRIC & MFG. CO., VERSUS THE DIAMOND METER CO.

The United States Circuit Court of Appeals in Chicago filed an opinion on January 31st last in the case of the Westinghouse Electric & Mfg. Company vs. the Diamond Meter Company in the suit brought for infringement of Telsa patents No. 511,559 and No. 511,560 in favor of the Westinghouse Co.

AMERICAN COTTON GOODS OPPORTUNITIES IN JAPAN.

Special Agent W. A. Graham Clark, writing from Japan, says:

The best system to follow is that used by manufacturers at home in introducing their goods into a new town. There are a good many American firms having branches in Japan, though only two or three handle textiles to any extent. The manufacturer should first get in touch with the New York house. A salesman should take out, not only a full line of samples with prices, but also several cases of the main goods he intends to introduce. On arrival this expert goes to the local house and secures their "banto" to go around with him to give information as to the most reliable firms and to introduce him. He shows his samples, proves their superiority, agrees to make modifications in detail where desired, quotes prices, and takes trial orders, which he can fill from the cases which he has brought with him, so getting his goods into immediate use, or else turns the orders into the local house, who cables them to the New York office. In six months' time the trade is established, and the expert leaves it to the local house to push, but returns for a month or so each season. This is the practical system in use by other nations and by many of our own manufacturers on other lines. An expert salesman so sent out should stay long enough for the customer to use the goods and find what modifications are necessary to make them suitable for general use.

BRITISH HOSIERY.

The London Times reports that "some very striking changes have recently taken place in the British hosiery industry," adding:

"From an international point of view, English manufacturers now occupy a much stronger position than they have held for a number of years. The enormous developments in the manufacture of hosiery fabrics in Germany, the erection of factories for the exclusive production of certain classes of goods, the running of machinery for longer hours each day, and the employment of cheaper labor, have made German manufacturers the most formidable competitors, especially in cheap low quality plain and fancy fabrics. The American competition, on the other hand, has been practically confined to flaacy backed heavy cotton underwear. To meet this competition for both the home and the colonial trade, English manufacturers have responded by laying down costly new automatic machinery, and they have been compelled also to displace male labor by females, till now there is something like five women engaged for every man in the trade. The trade unions concerned have recognized the absolute necessity for these changes in order to retain the trade here. The Germans still practically hold the field in the lowest class of fabrics made from shoddy yarns, and American manufacturers are still able to displace lambs' wool underwear by heavy cotton, but the latter fabrics are not favored by the medical profession.

It has been said times without number that the American cotton trade has but its own indifference to blame for the comparative insignificance of its sales to our neighbors, the Latin-American republics. And considering the great value of our purchases of commodities from these countries the meager share we have in the sales of the most important of their imports is simply amazing to our competitors on this side of the Atlantic.

With Cuba British trade is of considerable, though diminishing, magnitude. With our own non-contiguous territory, the Philippines, Lancashire's trade is of fair dimensions. England's greatest market for cotton goods is India, and India is also the largest buyer of such merchandise of any country in the world, China not excepted.—Exchange.

THE A. FRENCH TEXTILE SCHOOL AT THE GEORGIA SCHOOL OF TECHNOLOGY.

By Clifton Corley.

Just now when the textile schools are turning out more graduates than ever before, when new schools are building, and when new mills are going up like magic all over the country, the textile graduate has become a subject of interest to the mill man. Probably there is not a mill manager or superintendent who has not, at one time or another, asked himself questions about this young aspirant to high places in the textile world. "We need men," they reflect, "but how about this textile graduate? How much is he worth? What does he know? And where shall we place him when we get him?" These questions are answered by the profounders themselves in widely differing ways. It is not difficult to find the stern superintendent that has worked his way up by years of hard knocks and many lessons from that proverbial teacher, experience, who poo poo's the textile graduate as a soft tenderfoot who lives in ease and reads a few books about spinning frames for four years and then thinks he knows all about the mill business. This kind of man, however, is decidedly in the minority, and of course has never seen inside of a textile school, nor does he realize that the student as well as himself receives many lessons from the same hard teacher.

However, much has been written on this subject, usually of an abstract nature, and mostly in commendation of the textile school; for that reason it is not the purpose of this article to continue the discussion, but to describe in detail the equipment and course of work and study of a particular school as it is today; then the mill man can judge for himself.

The A. French Textile School is a part of the Georgia School of Technology and gives but one of the six courses offered by that institution. The course requires four years for completion and on graduation the degree of Bachelor in Science in Textile Engineering is conferred.

The school is especially fortunate in the choice of its director, Prof. William W. Randle, who is himself a graduate of one of the oldest and one of the largest textile schools in the United States, the Philadelphia Textile School, and who has had extensive practical experience as well, leaving a position as superintendent of a cotton mill to take up his present work.

PRACTICE IN RING SPINNING.

The equipment of the school is much more complete than is ordinarily supposed. It is a complete cotton mill from the Corliss engine in the basement to the spinning frames on the top floor. Capable of producing everything in the shape of yarn from 100's combed sea-island to red wrapping twine made of waste, and of weaving anything from grey sheetings to portier curtains. The mill building, which is three stories high, is a splendid example of modern mill construction. It is equipped with the Sturtevant system of heating and ventilating, humidifiers from the American Moistening Co., electric lights, automatic spindles, and in fact all apparatus and appliances found in the modern mill.

REELING, WINDING AND TWISTING—TEXTILE DEPARTMENT.

Great care has been exercised in the selection of the machinery. The plant is said to be the most complete in the world for education in the different branches of cotton manufacture. Several makes of each kind of machine has been installed, thus enabling the student to become familiar with most of the prominent makes now in use.

The top floor contains all of the machinery except that for weaving, finishing, dyeing and fancy beaming, and as stated, these machines are of different makes whenever there are more than one of a kind on the market.

The equipment comprises: Kitson and Atherton pickers, four most important makes of American cards, the Saco & Pettee; Whitin, Howard & Bullough, and Lowell; Saco & Pettee railway head; Saco-Pettee and Whitin drawing frames, Woonsocket, Saco-Pettee and Providence fly frames; Fales and Pettee railway head; Saco-Pettee and Whitin drawng frames; a Mason mule; Draper, Fales & Jenks, and Howard & Bullough twisters; Easton & Burnham, Draper, Whitin and Fairmount spoolers; two Universal winding machines; Fairmount bobbin winder, Draper and Entwistle beaming and warping machines; Lowell slasher, size kettle and size pump; Dobson & Barlow and Whitin sliver lap machines, ribbon lap machines and combers. Thus it will be seen that most of the important American machine builders are represented. This department also has a complete assortment of tools, hand machines and accessories, such as lap scale, grinding striping and burnishing rolls, carders' tools, gauges of all kinds, silver scale, banding machine, yarn testing machine, microscopes, etc.

The second floor is occupied by the weave room, designing room, class rooms and office. In the weave room there are thirty power looms and as many hand looms, the latter being used for experimental work in designing, together with beaming, quiling and skein winding machines. Of the thirty power looms there are at least twenty different kinds and there are twelve loom builders represented. This enables the student to draw conclusions as to the comparative worth of different makes and different motions. The following classes of goods at present on the looms will give some idea of the scope of the weaving department: sheeting, dress goods, a half dozen different kinds of fancy shirt-

ing, trouserings, upholsterings, portier curtains, nap and huck towels, a hammock, a damask table cloth, and a white counterpane. The product of the weave room is sold and the goods must come up to standard mill quality. It is impossible to avoid a rather high per cent. of seconds, but in spite of this and the short time that the machines are enabled to run, the textile department is self-supporting.

PREPARATION OF WARPS FOR WEAVE-ROOM.

The designing room is equipped with large tables, a shaded electric light to each and plenty of black board space ruled off like design paper for the convenience of the teacher. The card cutting machines and lacing frame are placed in this room.

On the bottom floor is the engine room, the cloth room, the dye house, the dyeing laboratory and a couple of store rooms. In the cloth rooms there are the usual machines for sewing, brushing, pressing and folding cotton cloth, together with two napping machines.

The dye house contains numerous vats found in all dye houses, a skein dyeing machine, a nap dyeing machine, a cloth dyeing machine and a raw cotton machine, a vertical cylinder, a centrifugal wringer, a steam box and a dye kettle.

With the exception of the various shapes, the foregoing represents pretty fully the equipment.

The school week is from Monday morning to Saturday noon. The working hours from 8 to 5 with an hour for dinner.

The work is divided between recitations, shop, mill and laboratory.

This particular textile school, unlike most others, gives a five years' course, because it believes that a graduate, to be equipped in the best possible way, should have more or less of a literary or college education; also a sound foundation in engineering subjects as well as in the branches relating directly to the textile trade.

Besides a thorough course in mathematics, English and physics, the student has one year's work each in the wood shop, blacksmith shop, machine shop and foundry; three months each in the steam engine room, strength of materials and electric laboratores; and four years' work in drawing. The last year's work in drawing is exclusively devoted to textile machinery.

In the carding and spinning department the Freshman student is first put on the spinning frames and then moved on from week to week as fast as he becomes proficient, until the end of the year, when in most cases, he has run every machine in the department. In the weave room he learns to operate the plain looms, and towards the last of the year, perhaps, he may run a few dobbies.

In the sophomore year this same plan is continued with the difference that the student runs more machines at a time and continues to progress in the weave room until he has run all the looms except the jacquards. He also does some beaming, drawing in and slashing.

During this year eight hours a week is given to elementary designing, everything from plain weave up to ply fabrics being studied. Color effects are also frequently tried. In connection with this work the student is given three month's work on the hand looms. The looms used for this purpose are arranged for any number of harness up to twenty, with four boxes and four beams. The cloth woven is only 12 inches wide and of course has no commercial value, but it gives the student a good idea of the effect of weave on take up, appearance of cloth, etc.

In the junior year the real work in textile training begins. The work in this department is taken up and every machine necessary to the making, spooling and warping of cotton yarn, from the saw gin to the spinning mill are studied in the minutest detail. The recitation work in weaving includes the study of cotton calculations of every possible kind that do not go back of the spinning frame. Instruction is then given on loom fixing, beaming, slashing, and designing of all loom parts and motions.

In the senior year, dyeing, the Jacquard machine, the Jacquard designing is taken up. The former is carried on by means of recitations, laboratory work, and dye house instructions, the last two by notes, drawings, and the actual work of designing.

In this year the mill work is almost entirely experimental work, and machines all over the mill are thrown out for the student to set right.

During the last three months a great deal of time is taken up by thesis work and by the visiting of surrounding mills.

PRACTICE IN JACQUARD WEAVING—TEXTILE DEPT.

In the foregoing no mention has been made of the special textile course which is given by the school. This course is exactly the same as the regular, in so far as purely textile matters go, but it takes in nothing else. Students taking this course only are enabled to finish in two years.

The Power Specialty Company, 111 Broadway, New York, has been awarded a contract covering the equipment of eight boilers with Foster superheaters at the United States Naval Proving Grounds, Indian Head, Md. The Foster superheater is also to be installed in the central power plants of the Brooklyn and Charleston Navy Yards and the United States Soldiers' Home, Baltimore.

New Machinery and Trade Notes.

THE THOMPSON PATENT MIRROR FINISH SPINNING RING.

The Draper Company, Hopedale, Mass., have manufactured double-flange spinning rings for over 35 years. The patent on the double ring expired some 20 years ago. Although having experimented with hundreds of ideas, the Company believes it impossible to better the shape or improve the principle for standard trade uses, thus leaving the possibility of betterment entirely within the process of manufacture.

Several years ago the company began making the rings round. This system is still in use with such improvements and modifications as have bee nsuggested by experience. There was constant demand for a round ring from the trade before invention met the want, and the company's patents cover the only known methods of producing such rings.

The new improvement is one that proves its value even more clearly than the rounding process. The new ring has an inside surface polish that reduces traveller friction so that it starts like an old ring. It therefore not only saves time, labor and expense while breaking in new frames or new rings, but it also allows a higher speed of frame if purchasers take advantage of the conditions presented.

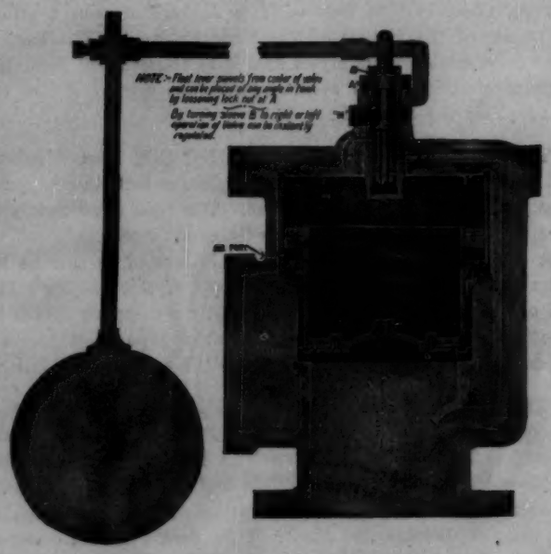
The speed of frames is very largely determined by the difficulties attending the first running. The usual mill is built to furnish yarn for a certain number of looms, and sufficient spindles are bought to furnish that yarn on the speed under which they can be started. If frames can be started at a higher speed, less spindles will be needed to give the necessary output, and considerable first cost in machinery and floor space can be saved.

Spinning rings usually receive their surface finish by the hand application of oil and emery on a stick, or by automatic metal contact of burnishing devices. Both hand polished and burnished finish cause severe friction on the ring surface, with grave chance for overheating and taking out the temper. The new process of polishing does away with all chance for overheating as it stretches the polishing process over hours instead of seconds. It also gives a smoother finish than the burnish process. The system used is entirely new in the art, and amply covered by patents both for method and apparatus. It is a continuous machine application of polishing material under natural forces, the extent of treatment depending on the time the machine is run and not on the whim of the individual.

The illustration above shows the ring as polished by the new machinery before the rest of the ring is finished. It is well known that practically all of the wear from the traveller comes on the inner flange surface. The rings the Draper Co. sell are finished all over, but the comparison of the polished surface with the black surface gives chance to note the perfection of the process.

THE GOLDEN-ANDERSON VALVE.

This valve, made by the Golden-Anderson Valve Specialty Co., Pittsburg, Pa., is of a heavy pattern, first-class material and workmanship, and owing to the correct mechanical construction, will operate under all the varying pressures up to and including 175 pounds. Attention is called to the upper portion of the body being lined with bronze, also the piston or valve being solid bronze, fitted with rubber cups and seat preventing any wear of the liner of valve which makes the valve practically indestructible.



The water coming under the piston or valve B enters through port L and M on top of valve. Owing to the greater area above the valve, it is held closed. When the lever is operated by the float the auxiliary valve closes port L and opens port through auxiliary valves for exhaust at N. Owing to the pressure on top of the valve being removed, the pressure under the valve forces it open. The water above the valve acts as a cushion in opening, and as the valve travels upward it draws in air through ports in the sides of the body to cushion the valve when closing. The valve being in a vertical position with the pressure acting directly under or on top of the valve when operated, particularly eliminates friction. The regulating auxiliary valve is all bronze, and so constructed that by loosening Lock Nut A and turning Sleeve B to the right or left, the operation of the valve can be instantly regulated to operate quick or slow as desired.

The Golden-Anderson Valve Specialty Company, make a most complete and heavy line of automatic valves for high pressure, steam and water service that is presented to the trade.

The Draper Co., Hopedale, Mass., are sending pocket diaries to all of the names on their "Cotton Chats" list, and also others interested in cotton manufacture. They still have a surplus left over which they would be very glad to use, and they also wish to increase their "Cotton Chats" mailing list. If any regular receiver of "Cotton Chats" knows of overseers, master mechanics, or second-hands in large mills, who would like to have "Cotton Chats" the Draper Company would be glad to get their names and will send them diaries until the surplus is exhausted. They also have a surplus of their regular calendars—not the thermometer kind—those are very scarce, but will be pleased to send copies of the regular style to any cotton mill men as long as they last.

B. F. PERKINS AND SON, Holyoke, Mass., have sent out catalog No. 78 containing 170 pages, printed in two colors on heavy calendar paper illustrated with numerous half-tones and cuts, a work of art in its general make up. The catalog describes styles A to V of the Perkins ventilating and exhaust fans, and explains the different systems of ventilation. Power transmission and power transmission machinery are fully treated. A set of information tables relating to ventilating, fans, belting, etc., make this catalog valuable for reference.

THE MONARCH ELECTRIC MANUFACTURING CO., Warren, Ohio, in The Tale of Two Jacks humorously inform the public of the virtues of the Monarch lamp. The lamp is made in several artistic styles and it is claimed for them that users of electricity will secure great efficiency at a low cost by adopting the Monarch.

THE WESTINGHOUSE MACHINE CO., East Pittsburg, Pa., in a handsome 31-page catalog gives a full description of storage batteries for stationary use. The type described is the pure lead sulphuric type which is constructed to meet the most exacting requirements. Parties interested in storage batteries should by all means have a copy of this catalog. It is full of valuable information compiled by a company which has spent many years of the time of an able corps of engineers in the development and perfection of the "Westinghouse" battery.

THE JOSEPH DIXON CRUCIBLE CO., Jersey City, N. J., are out with an usually handsome 39-page catalog entitled, Crucibles, Their Care and Use. This is a comprehensive book on the subject of graphite crucibles and should be in the hands of every one interested in the melting of the various metals. Mr. John A. Walker, the author of the book has been connected with the Joseph Dixon Crucible Co. for forty years. The purpose of the book is to instruct users of crucibles as to their use. The double page center of the book shows a vivid and realistic foundry scene in colors.

EVANS FRICTION CONE CO., Newton Centre, Mass., manufacturers of frictional gearing have sent out a comprehensive catalog for 1907. The catalog describes various types of friction cones and gives a list of users in this Country and Europe, and a number of testimonials from plants using the Evans. The points of superiority of the Evans Friction Cone are well brought out.

SKYLIGHTS, WINDOWS, VENTILATORS AND SHEET METAL WORK is the title of catalog "C" of the E. Van Noorden Co., Boston. The catalog is well gotten up on heavy paper and is profusely illustrated with half-tones showing various buildings equipped with Van Noorden skylights and ventilators. The catalog also shows types of metal shingles, gutters, etc., manufactured by this concern. It is a valuable catalog for all who are building or contemplating doing so.

METAL SIGNS, BADGES AND CHECKS of many styles are described in the catalog of N. Stafford Co., 66-68 Fulton St., New York. The designs are attractive, the quality of the goods first class, and the prices are reasonable.

AMERICAN WATER SOFTENER is the tital of an artistic booklet issued by the American Water Softener Co., Philadelphia. The booklet has an artistic cover, is printed on supercalendared paper, porfusely illustrated, and is typographically above criticism. The booklet describes interestingly the process of softening used in the American Softener. The laboratory of the company is under charge of expert chemists and samples of water submitted are analyzed and amount of chemicals for treatment determined. Results are guaranteed.

NIGHT VIEWS IN NEW YORK.—Chas. A. Shieren & Co., Perry St., New York City, have just issued an album of photographs of the most interesting points in New York City, these photographs having been taken at night. They are the first of the kind that have come into this office. While everybody is familiar with day time photographs taken in New York City, we believe the majority of our readers, like ourselves will be glad to receive a copy of this album. It will certainly bring back to the most of us very vividly the memories of our evenings spent in America's greatest city.

THE TABOR INDICATOR.—A catalog devoted exclusively to Tabor Indicators as made by the Ashcroft Manufacturing Co., 85-87-89 Liberty St., New York City, is ready for mailing to all users of indicators. This booklet takes up at length the construction of the company's type of indicator, the material of which it is manufactured, the various uses to which the different types are applied. The prices of the Indicators range from $85.00 to $140.00, depending upon the services for which the instrument is intended. The Ashcroft Company also manufacture a number of accessories such as planimeters, carrying pulleys, straightway or three-way cocks, boxes, scales, etc.

BOILER SCALE AND ITS REMOVAL.—This catalog has just been published by the Lagonda Manufacturing Co., Springfield, O., boiler cleaning experts for more than 20 years. The catalog describes and illustrates the Company's boiler type cleaner, direct motor cleaner, steam specialties and their application. While selling outfits direct to users, this Company also does boiler cleaning by contract and in this work uses these mechanical cleaners, which may be run by engine or motor up to 25 horsepower. The cleaner is practcally indestructible, as the only wearing parts are cheap and easily replaced. The Company's contract work runs up in the thousands yearly. Its clients include such concerns as the Hammond Packing Co., of Chicago; State Hospital at Columbus, Ohio; Kuhn, Loeb & Co., of New York City, and scores of others. The catalog contains some very handsome photographs illustrating the cleaning of boilers in large plants. In some of these plants the boilers were found to be almost entirely choked with scale, and the mystery is how it was possible to produce any steam whatever from them.

THE ADVANCE PACKING AND SUPPLY CO., Chicago, Ill., are distributing a 39-page catalog describing different types of ring packing, rod packing, gaskets, sheeting, sheet packing, metal polish, and tube scrapers manufactured by them. The Advance Company manufactures ring packing for general use and a superior quality for unusual or hard conditions. The strong points in this packing is that it is easy to apply and resists the effect of heat and high pressure. The Advance Company are agents for the Eagle brand German asbestos packing. The catalog should be in the hands of every one interested in packing.

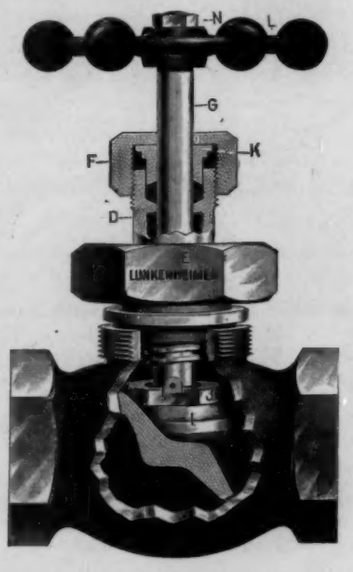
THE BERLIN ANILINE WORKS, 213 Water St., New York, have sent out color sheets of a new dye they are now putting on the market to be known as Columbia Bordeaux B. This dye is distinguished by its specially good fastness to light, not only for vegetable fibres, but also for mixed materials such as half-wool, half-silk, etc. Columbia B is readily soluble and dyes level. The dyeings possess a remarkable fastness to washing.

THE CASSELLA COLOR CO., of N. Y. City, have just issued new color sheets showing a list of attractive patterns in immediate colors for calico printing and fast dyeing on cotton goods. Especially attractive are patterns 7, 8, 9 and 13 in the calico list. The fast dyeing on cotton covers, moleskin and material for riding breeches and shows attractive patterns in brown.

The Hardie-Tynes Mfg. Co., Birmingham, Ala., have recently booked an order for the delivery of one of their large Corliss engines at Yokahoma, Japan, and have now a request by cable for figures on two cross-compound Corliss condensing engines. The quotations have been cabled to the Yokahoma inquirer and Mr. Tynes is inclined to believe that he will secure the second order. The Hardie-Tynes Company have sold a number of engines in the east and north, and have placed several in South America, but this is the first order which the company has received from the far east.

IMPROVED REGRINDING VALVES.

The Lunkenheimer Co., manufacturers of the well known Lunkenheimer engineering specialties, have made a number of desirable improvements on their regrinding valves. The changes are not at all radical, as the valve has been in use for half a century and has proven itself to be of correct design, having given general satisfaction wherever used. Its manufacturers have increased the weight of the valve as an additional precaution against rough handling while attaching, etc. All sizes of the valves now have lock-nuts on the hand wheels which facilitates the taking apart and assembling for repairs, etc.



Referring to the sectional illustration, it will be noticed that the hub which carries the operating stem is secured to the body by a union connection which, in turn, screws over the shell of the valve body. By means of this construction it is impossible for the hub and the body to become corroded together. The disc A is held loosely to the stem F, by means of the lock-nut J. To regrind the valve, the bonnet ring is unscrewed and the trimmings are removed from the body. A wire or nail is placed through the lock-nut and stem, a little powdered sand or glass and soap or oil is placed on the disc and the trimmings are again placed in the valve and reground. The valve can be packed under pressure when open or closed, and to pack while the steam is flowing through the valve, open same as wide as possible when the shoulder at the top of the stem thread will form a seat beneath the stuffing box. The material used is of the highest grade of bronze composition and the workmanship is in every respect commendable. Before being sent out of the factory, every valve is thoroughly tested and inspected. The company have in connection with their plant a complete physical and chemical laboratory which enables them to manufacture their products of such composition as are best adapted to withstand the chemical actions, strains, etc., to which the various products are subjected.

Help Wanted and Situations Wanted.

Advertisements not exceeding 50 words will be inserted on this page twice free of charge for any reader.

Textile manufacturers, superintendents, weavers, spinners, finishers, carders, dyers, and knitters are invited to use these columns without charge. Tell us what you want and let us help you find it.

POSITIONS WANTED.

Superintendent of cotton mills, American, age 40. Fifteen years' experience on sheetings, ginghams and all kinds of fancy cotton goods. Eight years in present position with good reasons for wishing to leave. Address 1, care Cotton.

Superintendent of knitting mill, textile graduate with five years' experience. Have worked on all grades of cotton underwear and familiar with most of the knitting mills on the market. Can refer to last employer. Address 2, care Cotton.

Superintendent of knitting mill. Ten years' experience in English and six years in American hosiery factories. 40 years old. References from present employer who is closing mill. Address 3, care Cotton.

Superintendent of cotton mills now employed in North Carolina. 35 years old, can give good references. Fifteen years' experience. Familiar with Draper, Whitin and Crompton & Knowles looms. Single and will accept position anywhere—North or South. Address 4, care Cotton.

HELP WANTED.

Superintendent of small cotton mill located in Georgia. Must be thoroughly experienced and a married man, not over 40 years of age. Must be able to give best of references. Address 5, care Cotton.

Superintendent of cotton mill. Must be thoroughly experienced and have best of references. Graduate of a textile school preferred. Must be familiar with and able to handle Southern labor. Send copies of references, state age and experience and pay wanted. Address 6, care Cotton.

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There is an apparent discrepancy at this point.

The pages are either missing or the pagination is incorrect.

The filming is recorded as the book is found in the collections.

NEWS OF COTTON MILLS, COTTON GINS, ETC.

ALABAMA.

Anniston.—The Blue Springs Cotton Mills, have been purchased by Philadelphia manufacturers, who will incorporate the Planters' Manufacturing Company to operate the plant. They will quadruple the capacity of the mill and manufacture cotton yarn, twine and rope.

Alexander City.—The Alexander City Cotton Mills have commenced business. The first installment of the machinery, comprising 164 looms and 6,500 spindles, will now begin operation, while other machinery will continually be installed up to a capacity of 20,000 spindles. This industry is capitalized at $250,000. C. E. Riley, a practical mill man, is President, and J. C. Carrick, Treasurer, both of Boston.

Jacksonville.—The directors of the Ide Cotton Mills, Jacksonville, Ala., at a special meeting there, voted to increase the capital stock of the company to $750,000. The proceeds will be used for the erection of another mill and for other improvements.

Huntsville.—The Rowe Knitting Company, at Huntsville, has purchased a large amount of new machinery for the cotton mill in West Huntsville and the capacity of the new plant will be increased about 2,000 spindles.

Clayton.—The Barbour Cotton Mills, capitalized at $50,000 have been incorporated by Robert Moulthrop, G. L. Comer, J. F. White and others.

GEORGIA.

Augusta.—The Rockmart Hosiery Mills are ready to begin operations. The plant is equipped with twenty-five knitting machines, and the product will be dyed and finished at the mill. The company has a capital of $10,000.

Americus.—The Board of Trade of Americus, Ga., recently considered a cotton mill proposition submitted some time ago and referred to a committee for investigation. This is the proposition wherein a mill man proposes to subscribe $75,000 to a company capitalized at $125,000, citizens of Americus to subscribe the remaining $50,000. After discussion, the matter was once more referred.

Griffin.—The Kincaid Mills at Griffin will double its capacity. This addition will give the mills 30,000 spindles. The owners are contemplating an additional investment of $30,000, which is regarded as a good move, as Griffin's six cotton mills are all doing a profitable business.

Dallas.—The Paulding County Cotton Manufacturing Co., Dallas, Ga., is reported to be contemplating doubling its present equipment.

Washington.—It is stated that a company will be organized with a capital stock of $500,000 to build a cotton mill at Washington, the plant to be driven by electricity transmitted from the water power development at Anthony Shoals on Broad river.

Athens.—The Southern Manufacturing Co., has let contract to T. J. Nichols for erection of an additional mill building, also for erection of operatives' cottages. It has also awarded contract for new machinery, including 1,260 mule spindles, 6,072 ring spindles and 3,840 twister spindles, and for electric motors. All other contracts have also been signed.

Columbus.—The Swift Spinning Mills has let contract to Geo. B. Hinman of Atlanta for erection of a three-story 134x178-foot cotton mill building. Plans and specifications were by C. R. Makepeace & Co., Providence, R. I. Swift Company will install 10,000 spindles. Clifford J. Swift is General Manager.

Dublin.—It is reported that the Dublin Cotton Mills has decided to increase its capital stock from $125,000 to $250,000.

Douglasville.—The New Century Cotton Mills have been purchased by Hal L. Johnston of Palmetto, Ga.; A. W. McLarty, J. T. Duncan and L. C. Upshaw of Douglasville who will organize a new company with capital stock of $200,000 for manufacturing cotton duck. They will also install about 7,000 spindles and accompanying looms to begin with. The main building is two stories high, of standard mill construction, with 80,000 square feet of floor space, besides engine and boiler rooms.

Eastman.—The Eastman Cotton Mills has increased capital stock from $58,000 to $100,000.

MASSACHUSETTS.

Fitchburg.—The complete plans and specifications for the new mill of the Fitchburg Yarn Company have been received by the officers from the architect, F. P. Sheldin, of Providence, R. I., and the work of construction will be begun at once. Work upon the foundation has already begun.

Gloucester.—The Gloucester Net & Twine Company, with a capitalization of $125,000, par value of stock $100, has practically sold out to the Linen Thread Company of New York.

Webster.—The Perry Yarn Hills has been incorporated with capital stock of $100,000 for manufacturing yarns of all kinds. The President and Treasurer is H. E. Smith.

Blackstone.—The equipment of the Blackstone Manufacturing Company is to be increased by 7,000 new spindles and 150 looms. The plant now has 41,792 spindles and 1,032 looms.

NORTH CAROLINA.

Rockwell.—It is reported that John W. Peeler of Rockwell, N. C., and Paul Barringer of Mt. Pleasant, N. C., are interested in plans for organizing a cotton-mill company at Rockwell.

Hendersonville.—S. B. Tanner, President of Henrietta Mills, Caroleen, N. C., and associates will build a cotton mill near Hendersonville, N. C.

Cherryville.—The Cherryville Manufacturing Co., is reported as expecting to expend $20,000 for remodeling and adding to its machinery.

Concord.—It is reported that the Odell Manufacturing Co., will displace its looms and replace with carding and spinning machinery.

Concord.—It is stated that P. A. Correll has ordered machinery to manufacture overalls; proposed daily capacity, 25 dozen pairs.

Cornelius.—The Cornelius Cotton Mills is reported to be preparing to install the finishing plant recently decided on by the company's stockholders.

Cornelius.—The Gem Yarn Mills Co., recently reported incorporated with $75,000 capital stock, is installing 3,000 spindles and accompanying machinery. J. B. Cornelius is President.

Fayetteville.—It is reported that the Tolar, Hart & Holt Mills will add 1,368 spindles.

Monroe.—It is reported that the Icemorlee Cotton Mills will build an additional mill. This company completed its present 5,000-spindle mill last June.

Wadesboro.—Wadesboro Cotton Mill Company will erect an additional building and add from 6,000 to 7,000 spindles.

Granite Falls.—The Granite Cordage Co. has been organized with capital stock of $25,000 to manufacture cotton cordage. Fifty braiders will be operated to begin with and 50 more will be added. Machinery has been ordered.

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COTTON MILL MACHINERY

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NEW YORK.

Cohoes.—There is a possibility of the Anchor Mills starting up cards that have not been in operation for ten years. The demand is so great that there is enough business to guarantee that the mills will run on full time until next fall. The Granite Mill is being operated overtime on account of rush orders.

Gloversville.—The Dempster & Place Company of this city, has been incorporated. The company manufactures gloves and mittens. The capital is $300,000.

Little Falls.—The Gilbert Knitting Company, of this place, will shortly start a new five-story brick mill, for the manufacture of cotton yarns. Allen L. Hatch will be superintendent of the new plant.

Utica.—Negotiations are pending for the sale of the Anchor Knitting Mills at Whitesboro, owned by Robert Ablett, to the proprietors of the Capron Knitting Co., of this city.

Whitehall.—It is reported that plans are under way for the establishment of a knitting mill here.

OKLAHOMA.

Shawnee.—It is reported that Geo. Warren of Boston, Mass., has submitted a proposition to organize a $300,000 cotton mill company for Shawnee, O. T. Another report from Shawnee is that Avalard Howard of Stafford Springs, Conn., and two New England manufacturers propose building a $250,000 cotton mill at shawnee.

Clinton.—Messrs. M. L. Holcombe and Charles W. Goodwin of Clinton, O. T., propose to capitalize at $350,000 their cotton mill company. Subscriptions for a considerable amount have been secured from local and outside investors.

PENNSYLVANIA.

Philadelphia.—The Bee Hosiery Co., manufacturers of seamless goods, are installing thirty new machines.

Reading.—Nolds & Horst, hosiery manufacturers, are contemplating enlarging their establishment. The northeast corner property at Ninth and Douglass streets will be raised and the plant extended along Douglass street several hundred feet.

Philadelphia.—Wolstenholme & Clarke, manufacturers of French system worsted yarn, have recently ordered two new spinning mules. This will make their total equipment about 15,000 spindles.

SOUTH CAROLINA.

Woodruff.—W. S. Gray & Sons are, it is said, to build a cotton mill for the maufacture of yarns, installing 10,000 spindles and using electricity for motive power. J. E. Sirrine of Greenville, S. C., is understood to be the mill architect in charge.

Laurens.—Watts Cotton Mill is reported as having awarded contract to G. C. Thompson & Bros., of Birmingham, Ala., for the erection of a 95-foot extension to present buildings.

Pendleton.—Reported that Pendleton Cotton Mills has begun the erection of an additional bulding and will increase its spindles from 3,100 to 10,000.

Greenville.—The Commercial Knitting Company of Greenville has increased its capital from $26,000 to $36,000, and has erected a building for bleaching.

Goldville.—The Banna Manufacturing Company, of Goldville has been incorporated with a capital of $75,000, to take over and operate the Banna Cotton Mills, having a plant of 7,100 spindles.

TENNESSEE.

Jacksboro.—The Board of Trade is working up the organization of a company to build a cotton mill.

Humboldt.—At a meeting of the directors of the Humboldt, Tenn., Cotton Mills it was decided to increase the capital stock of that concern from $73,000 to $100,000, the $27,000 in stock to be taken by present stockholders. The usual dividend was declared.

Newport.—C. F. Boyer will establish the Bellevue Cotton Mill to operate 5,000 spindles on the production of cotton yarns. Machinery has been purchased and is being installed. About $50,000 will be invested.

Harms.—The Walley Cotton & Grain Manufacturing Co. has been incorporated with a capital stock of $75,000 by G. F. Pitts, L. E. Strong, Thomas Bagley and others. It will build a cotton mill to be operated by water power.

TEXAS.

Celeste.—Britton Bros., of Dallas, Texas, have purchased the Perrin Cotton Mills at $50,000 and will overhaul the plant. Yarns and twines are manufactured.

Dallas.—It is reported that a $30,000 mattress factory will be established with Tom B. Burnett as Manager.

Giddings.—The Business Men's League is corresponding with Dallas parties looking to the establishment of a cotton mill.

Italy.—E. H. Murphy, Mayor, is corresponding with a financial company looking to the organization of a cotton-mill company with capital stock of $125,000.

Sulphur Springs.—Messrs. Britton Bros. of Dallas, Texas, have made a proposition to the Mayor of Sulphur Springs, for the establishment of a $125,000 cotton mill in the latter town. They offer to organize a company with capital stock of $125,000, asking that local investors subscribe $50,000 of the capital.

Jacksboro.—The Board of Trade is promoting the organization of a company to build a cotton mill.

Greenville.—J. F. Nichols, Mayor, is corresponding with capitalists who offer to organize a $125,000 cotton mill company.

Fort Worth.—The Texas Cotton Manufacturing Company, of Fort Worth, has filed a charter at Austin. Capital stock $100,000.

Dallas.—The Monarch Cotton Mills Company, of Dallas, has completed its buildings and installed the first equipment of machinery. This includes 4,100 spindles and other machinery for the manufacture of single hosiery yarns. Operations are expected to begin April 1. Later, 900 spindles will be added.

Midlothian.—The citizens of Midlothian, Tex., are making an effort to organize a cotton mill. Address T. J. Dorsett.

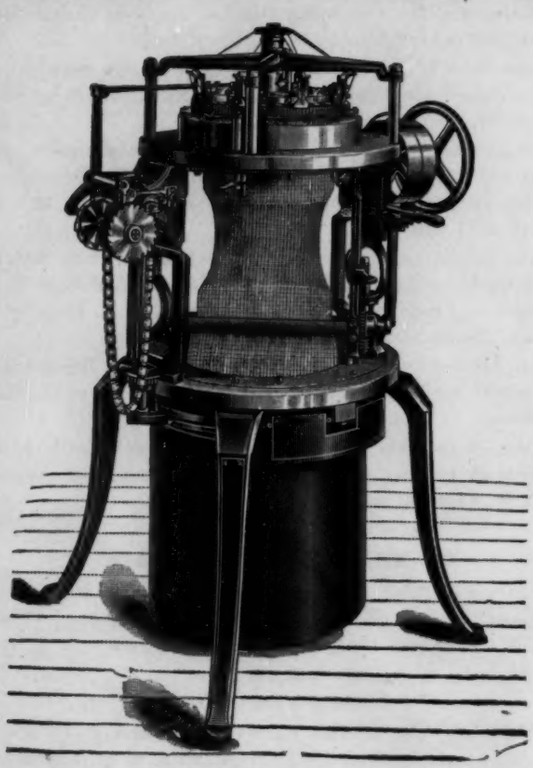
Marshall.—Mayor Daniel Heyn is corresponding with capitalists who propose organizing a $125,000 company for the erection of a cotton mill at Marshall.

Dublin.—Dubln has subscribed $117,000 stock for a cotton mill. A good live commercial club took hold of the matter at first.

Bartlett.—Bartlett is likely to have a cotton mill. A proposition having been submitted by some Eastern capitalists. The business men assembled in mass meeting and elected a chairman and secretary and are now going after the mill if the other people mean business.

VIRGINIA.

Williamsburg.—It is reported that the Williamsburg Knitting Mills has begun the erection of an addition 16x85 feet in order to provide space for new spinning machinery which has been contracted for.



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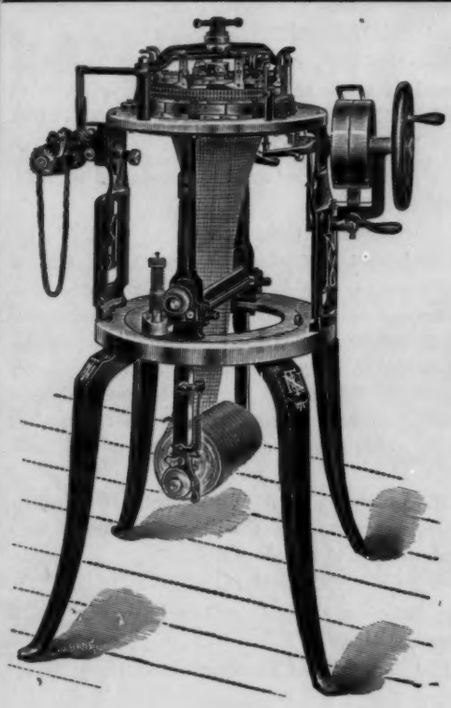

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KNITTING MILLS AND ENLARGEMENTS.

ALABAMA.

Huntsville.—It is reported that the Rowe Knitting Co., will add 2,000 spindles.

Fort Payne.—It is reported that one of the largest knitting mills ever located in the South will shortly be established at Fort Payne, in DeKalk County, Ala. While names of the promotors are not made public, or from what city they are said to be, northern capitalists experienced in the business have already purchased a building site for the mill.

CONNECTICUT.

Glastonbury.—Carl F. Dean, of Glastonbury, has taken the contract to build a brick buildng 20x30, for the Glastonbury Knitting Company at Addison, to be used as an engine room.

Durham.—W. T. Cole, J. H. Stone and A. V. Sorrell have incorporated the Chatham Knitting Mills Co., with capital stock of $50,000.

Raleigh.—The Martin Hosiery Mills of Raleigh, N. C., will build a dyehouse with daily capacity of 600 pounds and probably install additional knitting machines later on.

TENNESSEE.

Johnson City.—It is reported that Unaka Knitting Mills is to increase its knitting mills from 25 to 50 and to build a dye plant. W. B. Johnson is manager.

WISCONSIN.

Janesville.—The Lewis Knitting Company has increased its capital from $75,000 to $100,000. The additional capital will be used to make improvements and extensions to the plant.

COTTON GINS, COMPRESSES AND ENLARGEMENTS.

ALABAMA.

Aliceville.—A meeting of business men of Aliceville, Ala., was held recently for the purpose of organizing a stock company to put in a compress there. W. C. Miller, a representative of the Webb Compress Company, was present, and made the people a proposition, which will likely be accepted. The company will be capitalized at $30,000.

GEORGIA.

Macon.—The Massey Gin & Machine Works, with $25,000 capital stock, has been chartered by O. W. Massey and Walter Massey.

LOUISIANA.

Millhaven.—C. Sholars will rebuild his cotton gin recently burned. A two-story building 30x60 feet will be erected and equipped for a daily capacity of 25 bales.

OKLAHOMA.

Marshall.—It is stated that Marshall, Pearson & Hayton are preparing to build a modern two-story ginning plant at Marshall.

Butler.—The Butler Gin Co., has been incorporated with $5,000 capital stock by H. Henigan, D. T. Barton and B. L. Fudge.

Glencoe.—The Farmers' Union has let contract for a four-story coton gin costing about $16,000, and has organized a company with J. L. Matthews, President.

TENNESSEE.

Memphis.—The Memphis Warehouse Co., has increased capital stock from $300,000 to $550,000 and is to erect a co-operative system of cotton compresses and warehouses to cost about $500,000.

Chattanooga.—The Fuller Combing Gin Co., of which James T. Fuller of Charlotte, N. C., is President, has about completed arrangements for locating its plant, removing same from Charlotte, N. C. When completed the plant will represent an investment of $75,000.

TEXAS.

Creedmoor.—The Creedmoor Gin Co. has been incorporated with $10,000 capital stock by W. R. Davis and others.

Comanche.—G. A. Chilton and associates are reported to have purchased five acres of land with switch facilities and will begin the erection of a compress at once.

Dallas.—The Air Blast Gin Co., will manufacture in connection with the air-blast cotton gin, cotton-handling machinery and ginning systems complete. They do not propose to erect building until next season.

New Birmingham.—The Woolridge Gin Co. with $40,000 capital stock has been incorporated by John Woolridge, T. J. Sheppard of Frost, Texas; S. D. McCluney, E. A. Maloney of Foreston, Texas, and others.

Van Alstyne. —The Farmers Gn Co. has been incorporated with $6,000 capital stock by J. H. McKinney, Jesse H. Marr and others.

Lund.—Lund Gin Co. has been incorporated with $8,000 capital stock by Gus. O. Zaholm, Fred Bergman, Emil Gustafson, C. W. Forsdahl and Ludwig Kyleburg.

OIL MILLS AND ENLARGEMENTS.

GEORGIA.

Girard.—A. D. Hamby has purchased a controlling interest in the Girard Cotton Oil Mill and will install additional machinery and make other improvements.

INDIAN TERRITORY.

Chickasha.—The Apache Cotton Oil Company, Chickasha, I. T., has purchased from local parties ten acres of land adjoining the city and will erect at once an eight-press 160-ton mill. The building and equipment will cost $100,000. The company will also erect a $50,000 refinery, the first in the new state, with a capacity of 100 barrels a day.

MISSISSIPPI.

Aberdeen.—Allison Frierson of Aberdeen, is in correspondence with the board of trade at Columbia, Tenn., relative to the establishment of a cotton seed oil mill. Capital stock $75,000.

NORTH CAROLINA.

Cornelius.—It is proposed to establish a cottonseed oil mill. J. L. Smith is interested.

OKLAHOMA.

Cushing.—The Independent Cotton Ginners' Association of Oklahoma held their annual session of the year recently, closing up their business and making the preliminary arrangements for the erection of an independent cottonseed oil mill at Cushing during the coming summer. They have already secured a charter for the company, with $60,000 capital stock. The so-called trust cottonseed oil people have also secured a charter for a mill at Cushing with $75,000 capital stock, and a merry war will probably result.

Shawnee.—J. M. Aydelotte, P. A. Norris, both of Shawnee, O. T., and associates, are arranging for the establishment of a $125,000 cottonseed oil mill at Maude, O. T.

TENNESSEE.

Columbia.—The Board of Trade is considering a proposition to establish a cottonseed oil mill.

Hammond.—H. A. Mullally of Houston, Miss., is building a cottonseed oil mill.

Broussard.—The Broussard Cotton Oil Co., Ltd., has increased its capital stock from $40,000 to $60,000. A two-story brick building 180x40 feet will be built. It is proposed to have only two presses the first year. F. E. Voorhees is superintendent and chief engineer.

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TEXAS.

Burlington.—A company will be organized with G. W. Barclay, President, and W. A. Barclay of Crenshaw, Texas, Vice-President, to operate a cottonseed oil mill and cotton gin with a capacity of 150 bales in 24 hours. A small refinery for private use will be operated in connection. The expeller system will be used, and four presses and eight linters have been purchased. Others will be added if needed. tI is contemplated feeding the greater portion of hulls after they have been ground and bolted, so as to take the meal for export.

Madisonville.—It is reported that E. B. Seay is arranging for the establishment of a 40-ton cottonseed oil mill.

Bryan.—The Farmers' Cotton Oil & Fertilizer Co. has been incorporated with $50,000 capital stock to establish a 75-ton cottonseed oil mill and fertilizer factory. H. O. Boatwright is President; E. J. Fountain, Vice-President and W. S. Wilson, Jr., Secretary.

Houston.—The Independent Cotton Oil Co. has been chartered with $100,000 capital stock to build a four-press 80-ton cottonseed oil mill, for which contract has been let. A. B. Slack of Dallas, Texas, is President; W. Weatherford of Houston, Vice-President and General Manager, and L. T. Hubbell of Houston, Secretary-Treasurer.

Lyons.—It is reported that Ed Mattejowsky, Sr., O. F. Lyon, Marvin Murray, Joe Krecek and others have organized a company with $25,000 capital stock to establish a cottonseed oil mill and cotton gin.

Hamlin.—The Hamlin Oil and Cotton Company of Hamlin, Jones County, has been incorporated, capital stock $50,000. Incorporators, John Guitar, Jr., W. B. Guitar, F. S. Kean, James H. Guitar and S. P. Hardwicke.

PERSONAL MENTION.

The American Thread Company of Willmantic, Conn., has established a new department, that of mechanical engineering, in connection with the local plant and Malcolm Curry has been placed in charge of it.

George Vosburgh, superintendent of the Clayville (N. Y.) Knitting Co., has resigned and will accept a position with another large mill. E. W. Spore, for three years superintendent of a mill in Toronto, Canada, will succeed Mr. Vosburgh.

H. W. Bearden has been appointed to the secretaryship of the Saxon mill at Spartanburg, S. C. He succeeds the late L. E. Caston, whose death occurred only a short time ago.

J. Potter Harrington, formerly agent of the Saratoga Victory Mfg. Co., has resumed his old position at Schuylerville, N. Y. Charles R. Richardson of Lowell, Mass., has been appointed agent, succeeding Paul D. Smithson, who resigned.

Mr. Greenlee, from the Atlanta (Ga.) Woolen Mill, has taken the position of superintendent of the cotton plant of the Knoxville Woolen Mills in place of Mr. Beal, who has decided not to accept the position.

Albert Harbour, a graduate of the Technological School of Atlanta, Ga., has been elected assistant superintendent of the Fulton Bag & Cotton Mills, Atlanta, Ga. Mr. Harbour entered the school in 1900, winning the Aaron French scholarship in competitive examination, and graduated in 1904, with the degree of textile engineer. Afterward he served for a time as a member of the faculty.

C. M. Sears has resigned as superintendent of the Harmony Grove Mills at Commerce, Ga., which position he has filled for the last four years, and has been succeeded by Daniel Schofield, formerly of Pacolet Mill No. 4 of New Holland, Ga.

J. C. Mason, of Dallas, N. C., assumed the management of the Kesler Cotton Mills at Salisbury, N. C., recently, succeeding Frank L. Robbins, who resigned. Mr. Mason is said to be a man of high standing in the cotton mill business.

Mr. Moore, Manager of the Abbeville (S. C.) Cotton Mills, was elected President of the mills, at a meeting of the directors of the mills in New York recently.

W. W. Shealy, who was superintendent of the Enterprise Mill at Kings Mountain, N. C., when it was sold recently, has gone to Monroe, La., to superintend packing and shipping ping the machinery which J. A. Smith recently bought for his new mill at Bessemer City, N. C., mentioned elsewhere in this paper. The machinery will be shipped at once to the Smith Cotton Mill at Bessemer City, which Mr. Shealy will superintend.

E. H. Tuttle, formerly connected with the Trenton Cotton Mills of Gastonia, N. C., but more recently with the Boston office of James E. Mitchell Co., has just been elected secretary and assistant treasurer of the Aetna Cotton Mills of Union, S. C.

A change has been made at the Acushnet Mill, New Bedford, Mass., by which Frank H. Shumway becomes general superintendent of all the departments. Mr. Shumway was advanced a year ago to the superintendency of the ring spinning and carding departments, while Charles E. Taylor was superintendent of the weaving and mule spinning departments. Mr. Taylor left the employment of the corporation last week and Mr. Shumway is to assume the direction of all departments.

C. O. Conner, of Griffin, Ga., has suceeded R. H. Force, at the Pepperton Cotton Mill, Jackson, Ga.

Arthur J. Follet, Secretary ; Joseph W. Betagn, Assistant, to the General Manager and Trubee Barrows, boss dyer at the Glenark Knitting Company, Woonsocket, R. I., have concluded their duties with that concern. The works have been shut down for some time, and the release of the men is in connection with the settling up of the affairs of the company.

The 25th anniversary of the service of James R. MacColl as Treasurer of the Lorraine Mfg. Co. of Pawtucket, was observed by a banquet at the Crown hotel, Providence, R. I., recently. A gold watch of special design was presented to Mr. MacColl by the agent for the Lorraine Mfg. Co., M. H. Dorman of New York, the latter acting for those assembled in honor of the occasion.

Owing to ill health John C. Carey has resigned as General Manager of the Lockhardt (S. C.) Mills and is succeeded by Alfred Moore, formerly General Manager and Superintendent of Tucapau Mills, Tucapau.

J. A. McLaughlin, who concluded his labors as overseer of weaving at the Globe mill (R. I.), recently was much surprised when 300 of the help and the overseers gathered about him and presented him with a pai rof gold cuff buttons and a handsome watch and chain.

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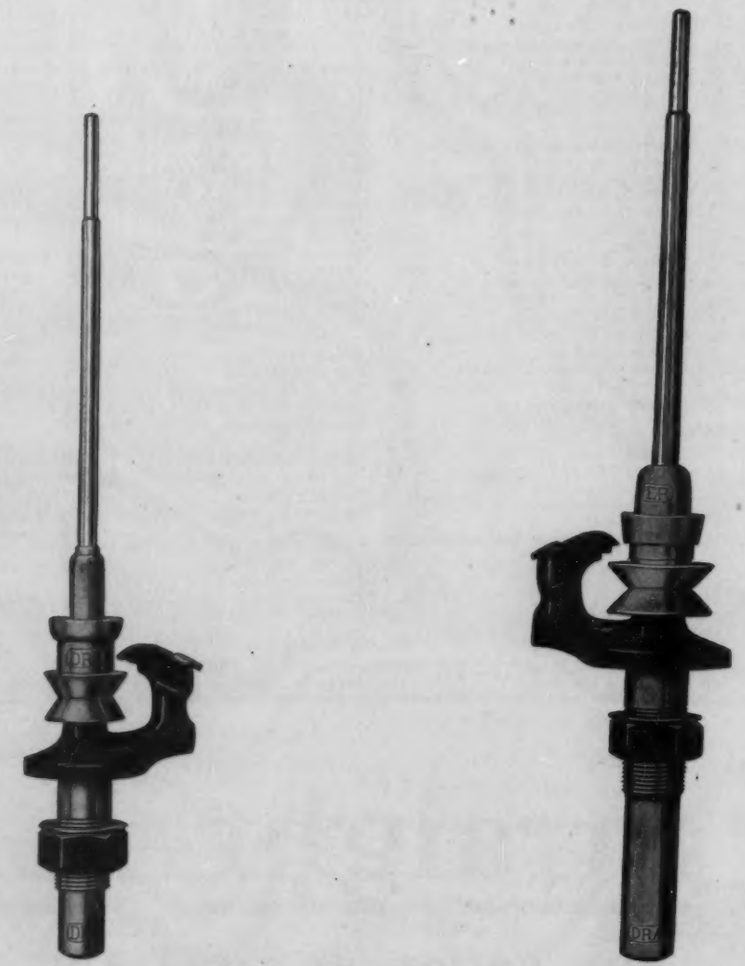

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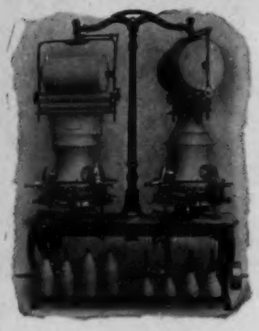

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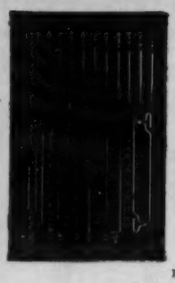

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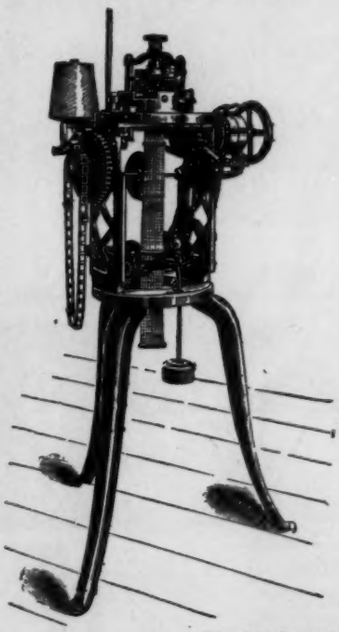

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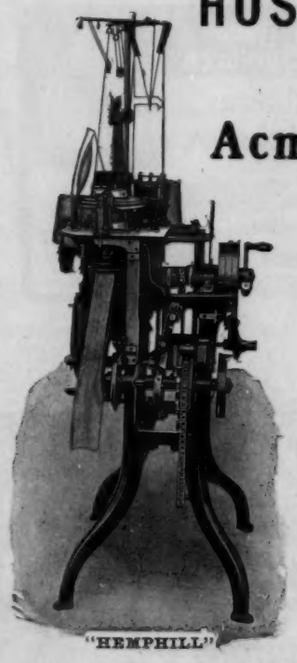

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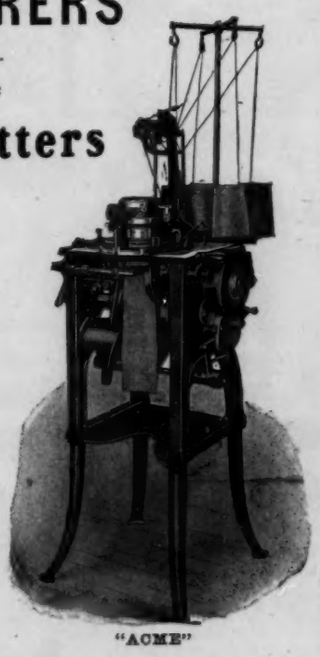

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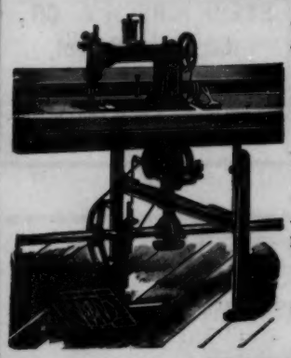

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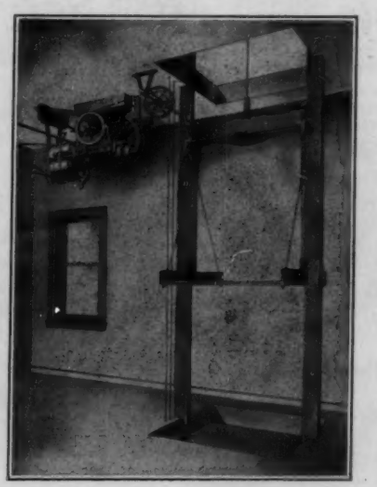

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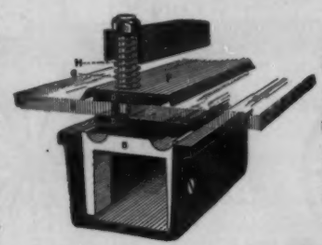

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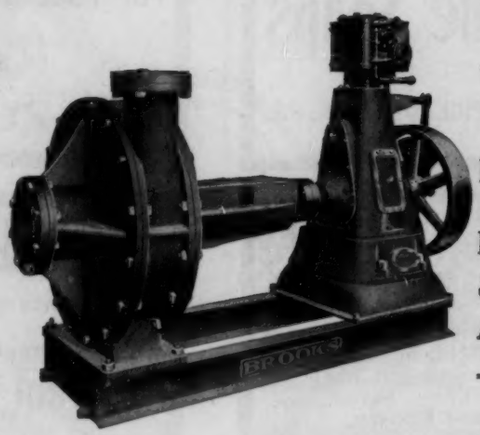

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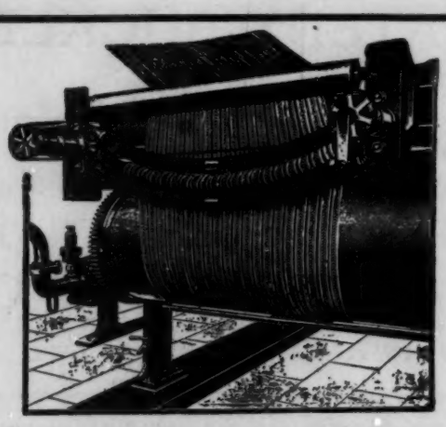

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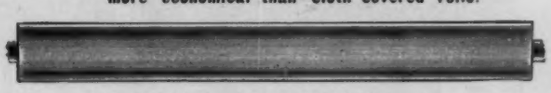

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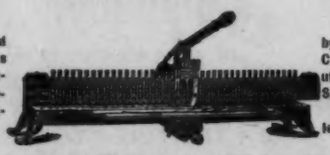

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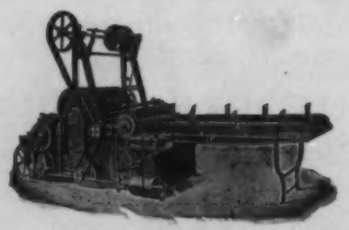

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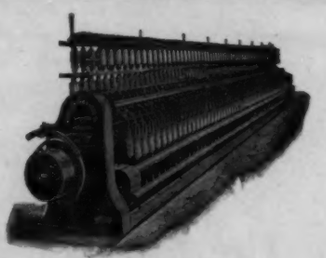

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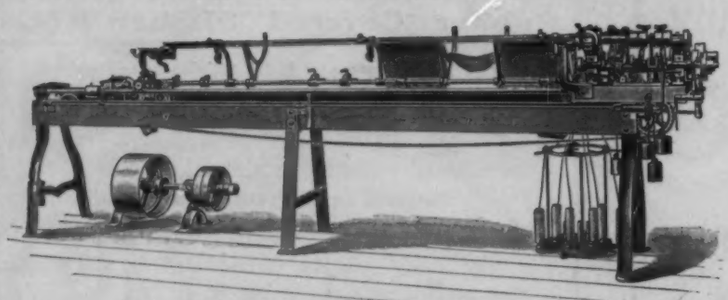

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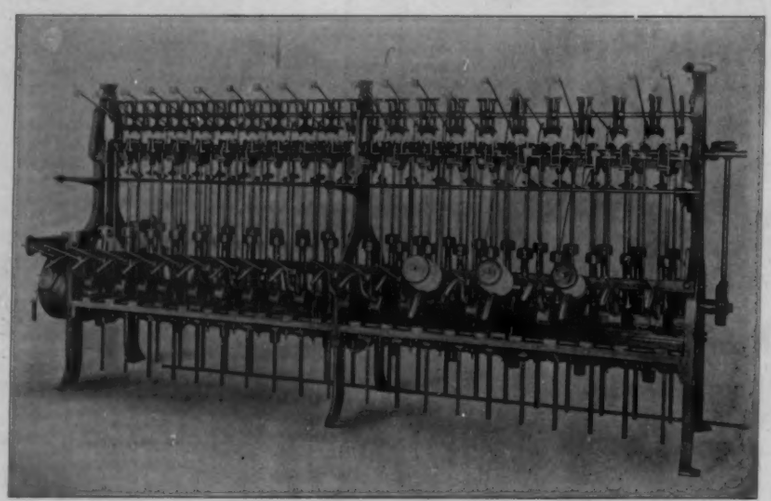

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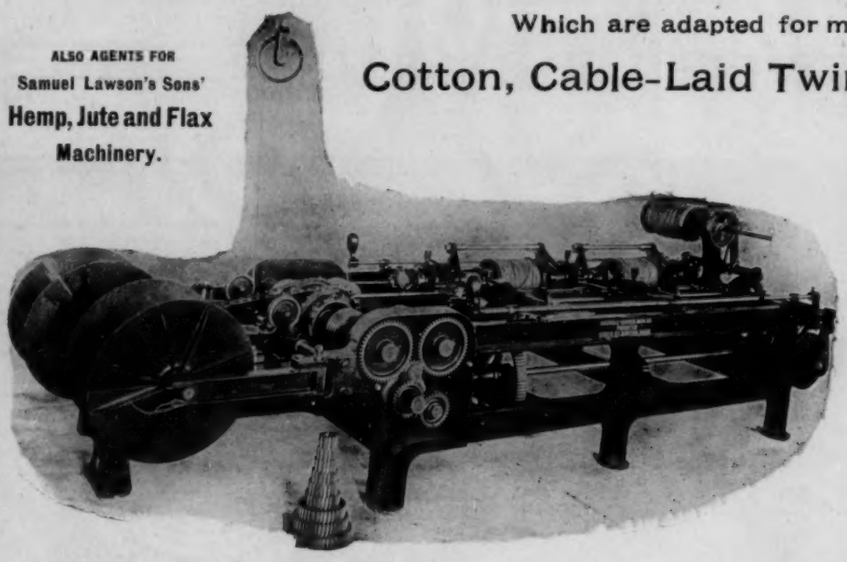

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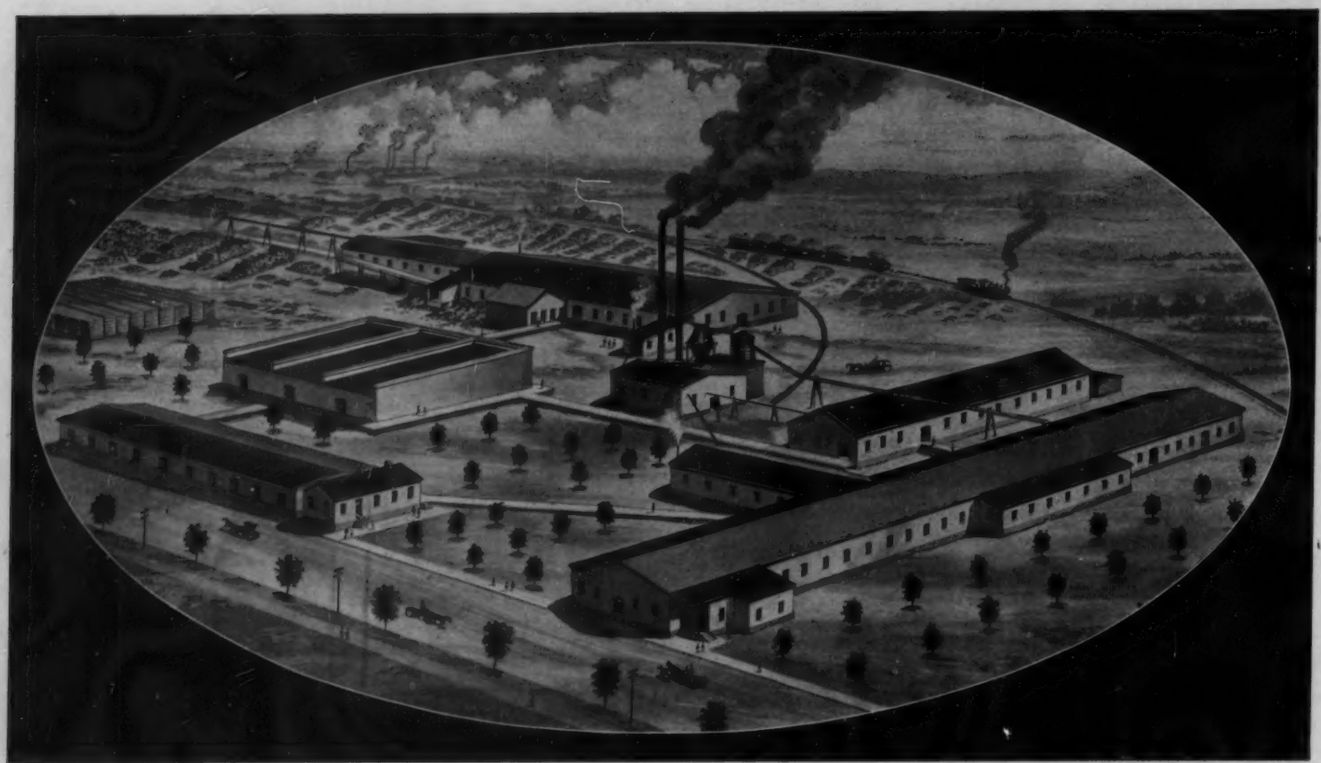

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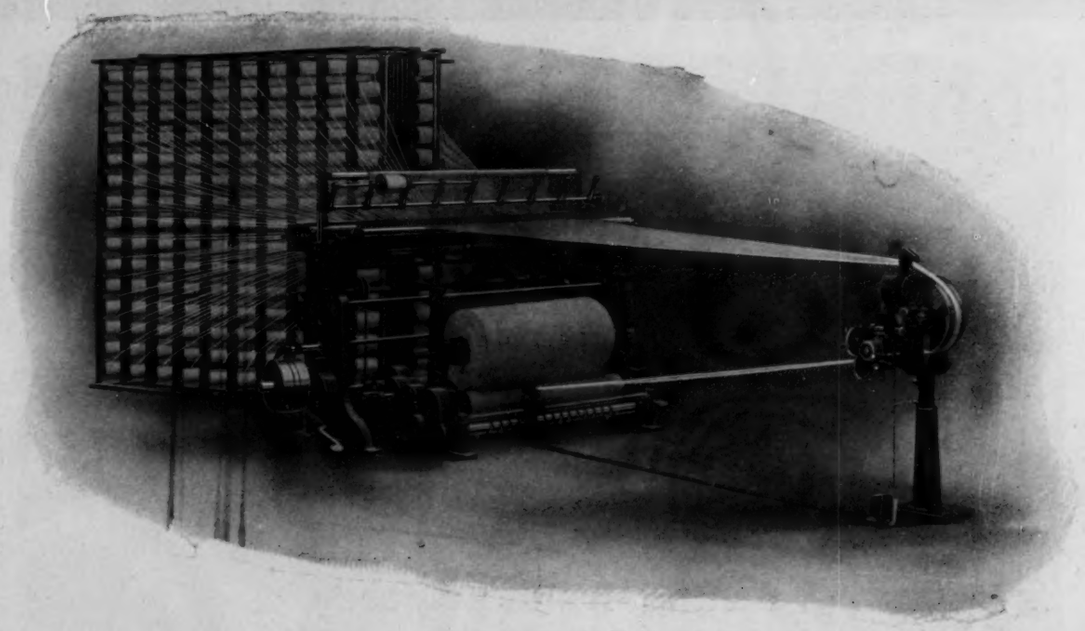

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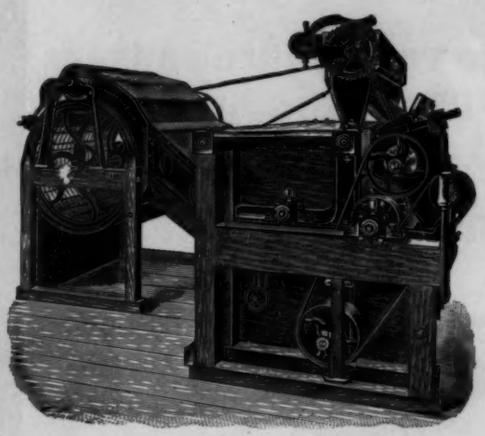

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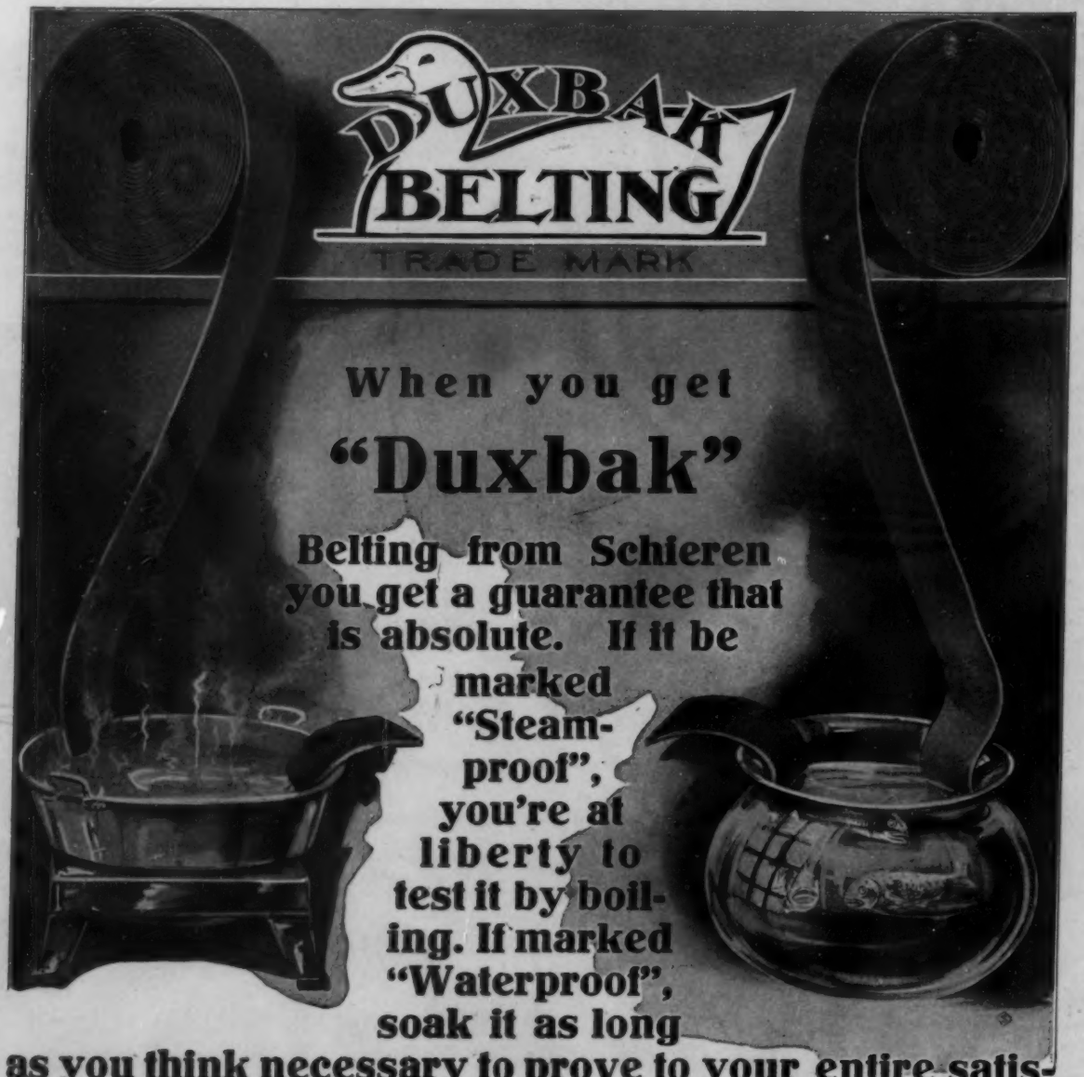

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overcomes friction troubles, both great and small, from a hot bearing on the mill engine to the fluffing of a mule-band.

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NON-FLUID OILS represent a distinct advance over fluid oils and greases.

They do not drip like oils, do not waste power like greases. Better than fluid oils, better than greases.

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Removes Heat, Steam, Gases, Cools, Dries, Purifies.

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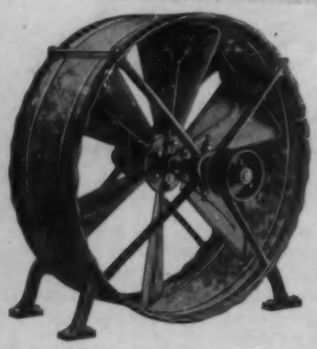

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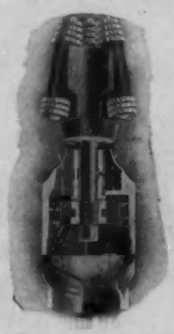

Get one on trial and test it; if it is not the best turbine you ever used send it back at our expense.

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No other turbine has two bearings, front and rear, to hold the center bolt in line. In those having only one bearing there is undue friction from side thrust which in time wears the bearing loose. The shaft of **The Weinland Turbine** is drilled to lubricate the rear bearing from the oil cavity which supplies the forward bearing. Friction is so lessened in these accurately-reamed and well-oiled bearings that it is little, if any, more than with ball bearings. The bearings may be replaced, but with proper oiling are good for years of service.

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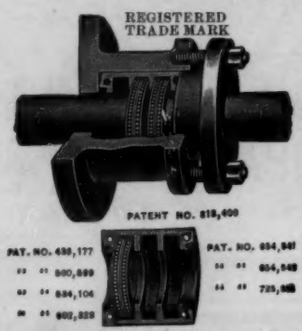
Holmes Metallic Packing

In Use in a Majority of Fall River, Lowell, Lawrence and Rhode Island Mills.



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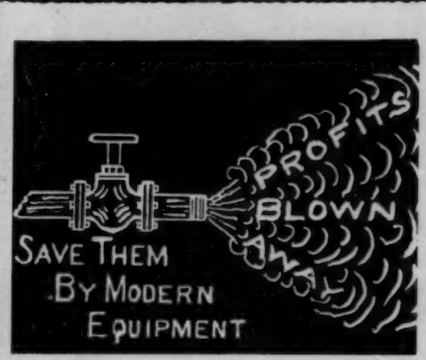

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Fully satisfy the demands of modern engineering practice where the requirements demand appliances to regulate and economize steam and insure safety.

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Foster Relief or Free Exhaust Valve, of five appliances that for safety and practical economy should be included in the equipment of every steam plant of any size in operation to-day.

The first will preserve a fixed uniform lower delivery pressure regardless of fluctuation in initial or boiler pressure.

The second is unequaled for steam heating or other low pressure service up to 15 lbs. delivery.

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The fourth does not interfere with the outflow of steam from each boiler of a battery as generated but it prevents inflow of steam to a boiler from the rest of the battery—it assures safety.

The fifth will give instant relief if the condenser were to fail and a loss of vacuum occur.

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FOSTER ENGINEERING COMPANY,

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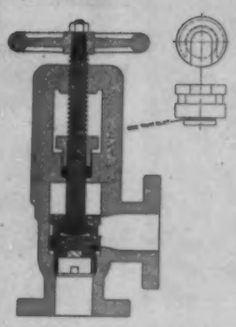
THE ANDERSON CUSHIONED NON-RETURN VALVE.

PROTECT YOUR BOILERS WITH AN ABSOLUTE SAFETY STOP.

They will automatically cut off a boiler in case of accident to the boiler, such as the bursting of a tube, and will also act as a SAFETY stop to prevent steam being turned into a cold boiler, which also means a safeguard for men working inside. THEN WHY endanger your power plant by using the regular Angle, Globe or Gate Valves at your boilers, when you can get the Anderson Cushioned Non-Return Valve, which is an **Automatic Stop Valve,** also a **Hand Stop Valve,** all in one.

The Golden Tilting Steam Trap.



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The Golden "Clean Seat" Blow-off Valves are regarded as the best Blow-off known.

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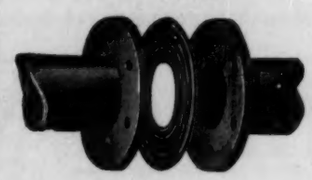
Mill Fire Hose and Fire Department Supplies.

Our Patented Mineral Wool Pipe Covering and Copper Gaskets.



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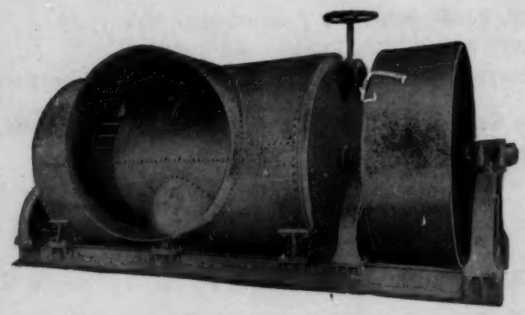

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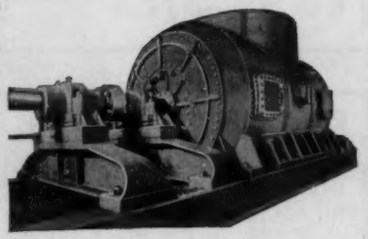

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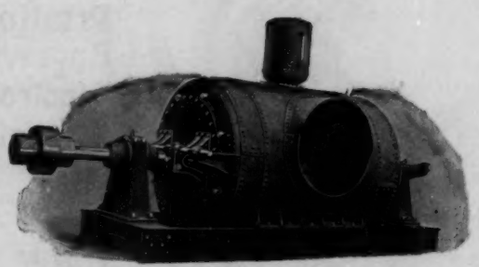

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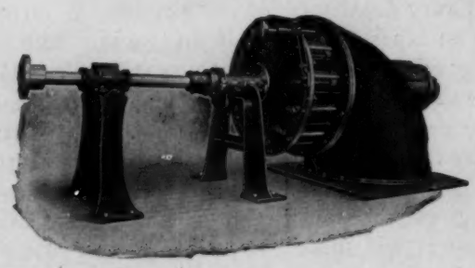

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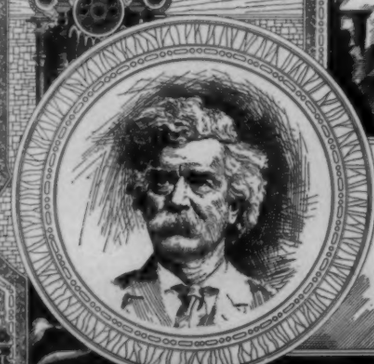

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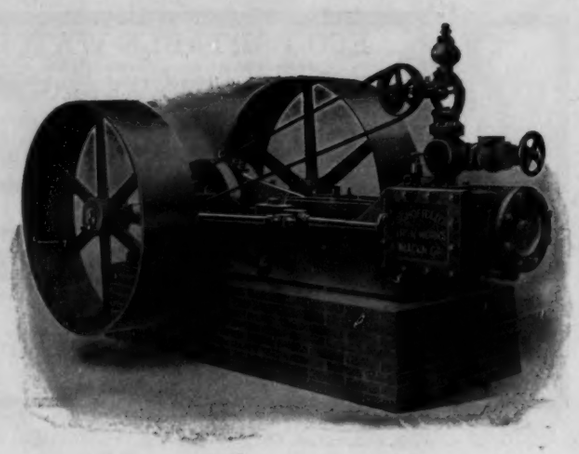

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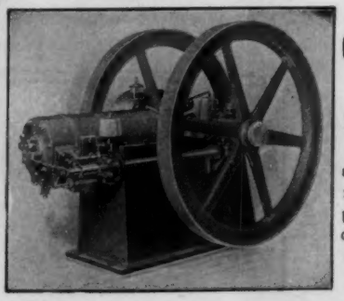

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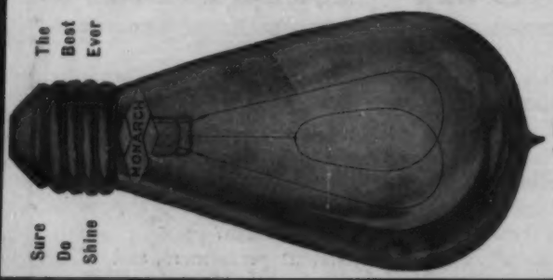

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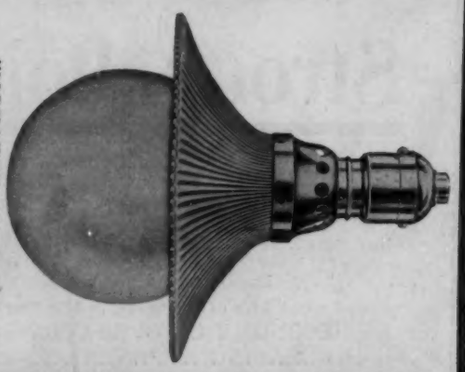

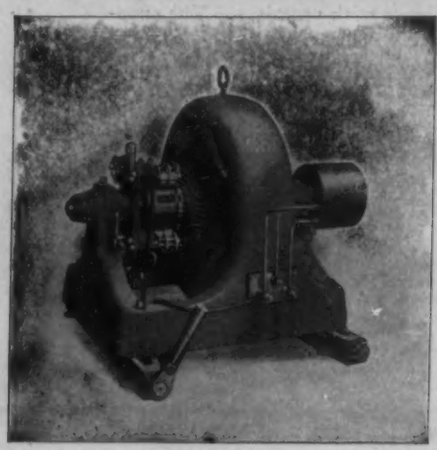

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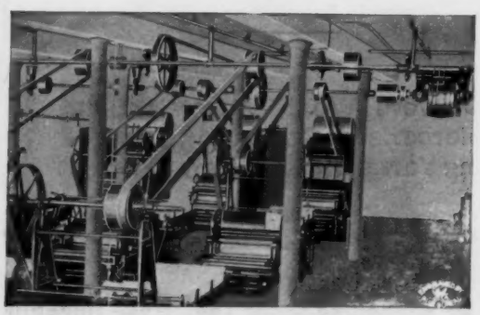

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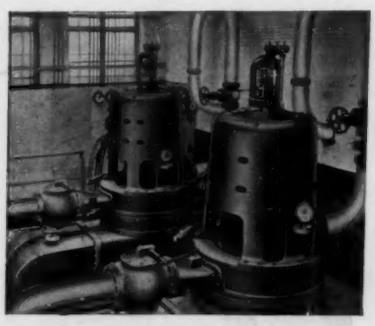

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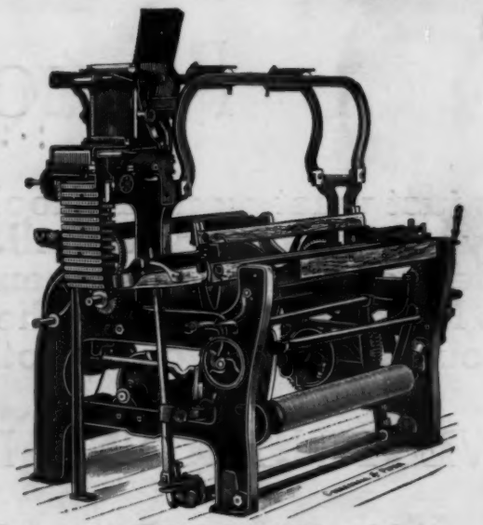

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